

Company name:

## **ICP Test Report Certification Packet**

Littelfuse, Inc.

Product Series:	5x20 Fuse
Product #:	215xxxXP
Issue Date:	March 15, 2013
2011/65/EU)-restricted supacking/packaging material In addition, it is hereby refor unit parts, the packing/	Littelfuse, Inc. that there is neither RoHS (EU Directive 2002/95/EC ubstance nor such use, for materials to be used for unit parts, for als, and for additives and the like in the manufacturing processes. ported to you that the parts and sub-materials, the materials to be used packaging materials, and the additives and the like in the manufacturing sed of the following components.
	Am h
	Issued by: KRISTEEN BACILA
	<global ehs="" engineer=""></global>
(1) Parts, sub-materials a	and unit parts
This document cov Littelfuse, Inc.	ers the 5x20 Fuse RoHS-Compliant series products manufactured by
< Raw Materials U	sed
Please see Tab	le 1
(2) The ICP data on all r	neasurable substances
Please see app	ropriate pages as identifed in Table 1
Remarks :	



Table 1: List of Raw Materials covered by this report

<b>Total Parts</b>	Raw Material Part Number	Raw Material Description	Page(s)
		Cap (Copper Shell)	
1	C910510/ 910-553	Base & Plating	3-6
		Cap Base	7-10
2	910-556	Cap Plating	11-13
3	YJ50/YJM (909-449)	Ceramic Body	14-24
4	11-0595 (082xxx)	Tinned Wire – Cu99.9MSn	25-28
5	0042xx	Tinned Wire – Cu Clad (CuNi44 Sn)	29-34
6	687xxx-001	Silver Plated Wire- Ag-Cu Sn Plated	35-40
7	648901	Yarn	41-47
8	YT-09 (195116)	Flux	48-57
9	YTW102 (692539-002)	Solder	58-62
10	YTW206 (692529)	Solder	63-67
	934-073, C030210		68-83
11	934-077, 934-078, 934-084,934-085, 934-089 , C030204	Overcaps – Fuses Copper Shell (base and plating)	84-87
12	EP608 (087355)	HMA-Glue (Epoxy Adhesive)	88-99
13	091250	Sand Filler	100-106
14	091251	Sand Filler	107-113
15	091254	Sand Filler	114-120
16	425900	Ink-Orange	121-131
17	425901	Ink- Red	132-142
18	425902	Ink-Black	143-153
19	425903	Ink-Yellow	154-164
20	425904	Ink-Blue	165-175
21	425906	Ink-Brown	176-186
22	425907	Ink-Green	187-197
23	425909	Ink-Grey	198-208
24	425911	Ink-Violet	209-219
25	425913	Pale Blue Ink	220-230
26	C610(909-532)	Ceramic Tube KER610	231-259



# **TEST REPORT**

NO.: A002R121008024-1R02

Date: Oct.10, 2012

Page 1 of 4

Customer: SuZhou FuHong Electronic Industrial Co., Ltd.

Address: NO. 89 WEI DU ROAD, WANGTING TOWN, XIANGCHENG DISTRICT, SUZHOU, CHINA

Report on the submitted sample said to be

Sample name: Copper shell

Model: /

Item/Lot No.: /

Material: /

Buyer: / Supplier: /

Manufacturer: /

Sample received date: Oct. 08, 2012

Testing period: From Oct. 08, 2012 to Oct. 10, 2012

### **Testing Requested**

As specified by client, to determine the Lead, Cadmium, Mercury & Hexavalent Chromium content in the submitted sample in accordance with Directive 2002/95/EC (RoHS).

### Testing method:

Testing Item	Pretreatment method	Measuring instrument	MQL
Lead (Pb)	IEC 62321: 2008, section 9	ICP-OES	2mg/kg
Cadmium (Cd)	IEC 62321: 2008, section 9	ICP-OES	2 mg/kg
Mercury (Hg)	IEC 62321: 2008, section 7	ICP-OES	2 mg/kg
Chromium (Cr VI)	IEC 62321: 2008, Annex B	UV-VIS	0.02mg/kg*

#### Note:

### Conclusion:

-When tested as specified the submitted sample complied with the requirements of commission Decision of 18 Aug 2005 amending Directive 2002/95/EC notified under document 2005/618/EC.

\*\*\*\*\*\*FOR FURTHER DETAILS, PLEASE REFER TO THE FOLLOWING PAGE(S)\*\*\*\*\*\*

Signed for and on behalf of Shenzhen AOV Testing Technology Co., Ltd, Kunshan Branch

Project Leader:

Li Tingting, Maggie

Chemical Test Director

Wang Wexin, Weikin

Technical Director

Approved by:

Yuan Qi, Mickey

Lab Manager



<sup>-\* 0.02</sup> mg/kg refers to the MQL of sample extraction liquid.



out sample

## **TEST REPORT**

NO.: A002R121008024-1R02 Date: Oct.10, 2012 Page 2 of 4 Test Flow: 1. To Determine Lead, Cadmium Content: (Metal substrate) Tested by: ondul Add the digestion solution; the Weigh the sample into Add H<sub>2</sub>O<sub>2</sub> until the sample is clear vessel is heated until the sample a vessel. has been dissolved Cooling the vessel, filter; washed and Tested by ICP-OES Report filled to the mark with distilled water. 2. To Determine Mercury Content: (Metal substrate) ondu Tested by: The sample is digested in the Weigh the sample Add the digestion solution, close microwave oven following a specific into a vessel. the microwave vessel. decomposition program. Cooling the vessel, filter; washed and Tested by ICP-OES Report filled to the mark with distilled water. 3. To Determine Hexavalent Chromium Content (boiling- water- extraction): (Metal substrate) Tested by: Remove the sample, and cool Take the (50±5) cm<sup>2</sup> Heat 50 mL of DI water in the beaker to room temperature, sample in the beaker. the beaker to boiling for 10 and do the color reaction Test the sample solution and the 0.02 Report mg/kg standard solution by UV-VIS. 4. To Determine Lead, Cadmium and Mercury Content: (Plating) Tested by: now Cooling, filter; washed and Tested by Weigh the plating-Report



Instrument

filled to the mark with DI water.



# **TEST REPORT**

NO.: A002R121008024-1R02

Date: Oct.10, 2012

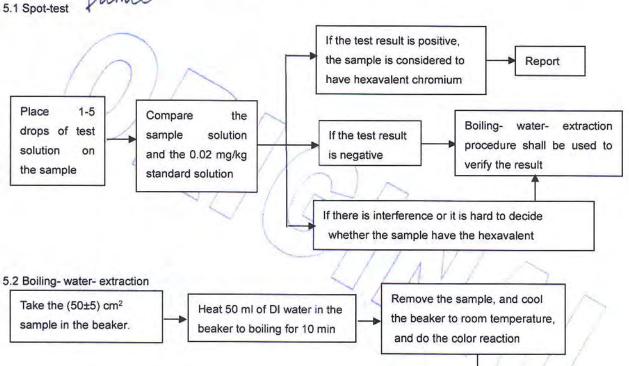
Page 3 of 4

Test the sample solution and the 0.02

mg/kg standard solution by UV-VIS.

5. To Determine Hexavalent Chromium Content in colorless and colored chromate coating on metals: (Plating)

Tested by:



Report

### Sample Description:

Code	Sample Description
1-1	Substrate
1-2	Plating

#### Test Results:

Item	Unit	RoHS Limit	Results		
			1-1	1-2**	
Lead (Pb)	mg/kg	1000	N.D.	10	
Cadmium (Cd)	mg/kg	100	N.D.	N.D.	
Mercury (Hg)	mg/kg	1000	N.D.	N.D.	
Chromium (CrVI)	mg/kg	1000	Negative	Negative	





## **TEST REPORT**

NO.: A002R121008024-1R02

Date: Oct.10, 2012

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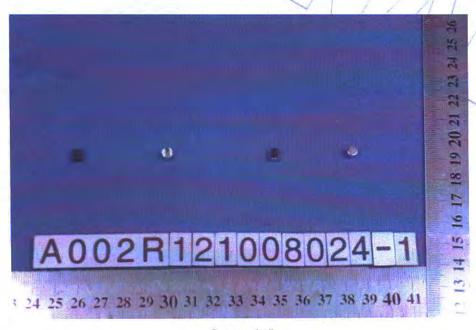
#### Note:

- -The new RoHS directive 2011/65/EU, on Jul. 21, 2011 come into force, on Jan. 03, 2013 the formal implementation, Directive 2002/95/EC shall be repealed simultaneously.
- -Specimens, which requested to determine Lead, Cadmium and Mercury Content, have been dissolved completely.
- -mg/kg=ppm
- -N.D.=not detected(<MQL)
- -MQL=Method Quantitation Limit
- -Negative=Absence of Cr (VI);
- -Positive=Presence of Cr (VI)

Uncertain= can not verify whether the sample have Hexavalent Chromium by spot-test.

- (The tested sample should be further verified by boiling-water-extraction method if the spot test result is uncertain or negative.)
- -\*\*The test is based on the following assumption: The sample plating is a single layer and each part is uniform. The test result maybe cannot stand for the physical truth of sample plating.
- -Photo is included

#### Photograph of Sample



Copper shell

\*\*\*End of Report\*\*\*





Report No. RLSZE001492100002

Page 1 of 4

Applicant

DONGGUAN CITY XINHAI METAL PRODUCTS CO.,LTD

Address

I 'ST WEIMING ROAD HENGZENG AV.XINAN COMMUNITY CHANGAN

TOWN DONGGUAN CITY GUANGDONG PROVINCE

The following sample(s) and sample information was/were submitted and identified by/on the behalf of the client

Sample Name

BASE OF CAP

Material

**BRASS H65** 

Sample Received Date

Nov. 16, 2012

Testing Period

Nov. 16, 2012 to Nov. 19, 2012

**Test Requested** 

As specified by client, to test Lead(Pb), Cadmium(Cd), Mercury(Hg),

Hexavalent Chromium(Cr(VI)) in the submitted sample(s).

### **Test Method**

Test Item(s)	Test Method	Measured Equipment(s)	MDL
Lead(Pb)	IEC 62321:2008 Ed.1 Sec.9	ICP-OES	2 mg/kg
Cadmium(Cd)	IEC 62321:2008 Ed.1 Sec.9	ICP-OES	2 mg/kg
Mercury(Hg)	IEC 62321:2008 Ed.1 Sec.7	ICP-OES	2 mg/kg
Hexavalent Chromium(Cr(VI))	IEC 62321:2008 Ed.1 Annex B	UV-Vis	1

Test Result(s)

Please refer to the following page(s).

Reviewed by Approved by Danny Liu

Nov. 19, 2012

No. 11033098

Centre Testing International (Shenzhen) Co., Ltd. Hongwei Industrial Zone, Bao'an 70 District, Shenzhen, Guangdong, China



Technical Manager



Report No. RLSZE001492100002

Page 2 of 4

Test Result(s)

est Result(s)		
Tested Item(s)	Result	
Lead(Pb)	13 mg/kg	
Cadmium (Cd)	N.D.	
Mercury(Hg)	N.D.	
Hexavalent Chromium(Cr(VI))	Negative	

**Tested Sample/Part Description** 

Metal base

Note:

The sample had been dissolved totally tested for Lead, Cadmium, Mercury.

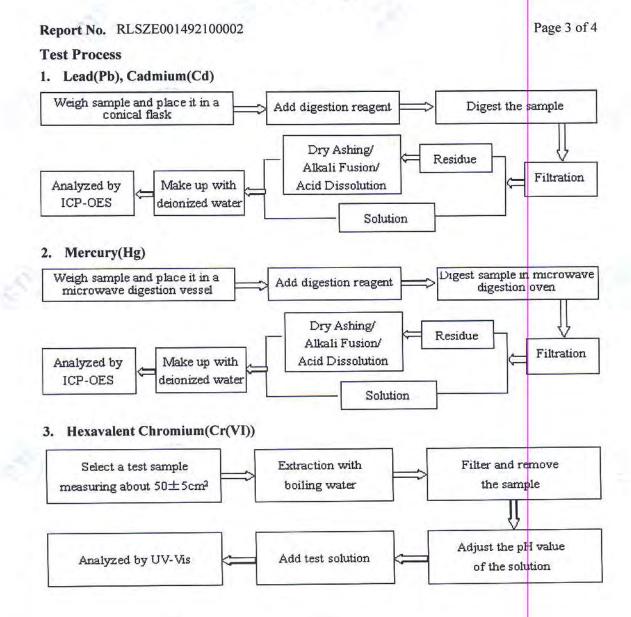
-MDL = Method Detection Limit

-N.D. = Not Detected (<MDL)

-mg/kg = ppm = parts per million

-Negative = Absence of Cr(VI), the detected Cr(VI) concentration in the boiling water extraction solution is less than 0.02 mg/kg with 50cm<sup>2</sup> sample surface area used.



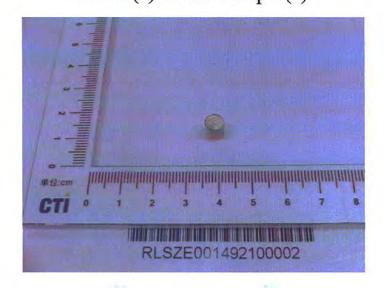




Report No. RLSZE001492100002

Photo(s) of the sample(s)

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\*\*\* End of report \*\*\*

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Report No. RLSZE001492100001

Page 1 of 3

Applicant

DONGGUAN CITY XINHAI METAL PRODUCTS CO.,LTD

Address

I 'ST WEIMING ROAD HENGZENG AV.XINAN COMMUNITY CHANGAN

TOWN DONGGUAN CITY GUANGDONG PROVINCE

The following sample(s) and sample information was/were submitted and identified by/on the

behalf of the client

Sample Name

SILVER COLOR PLATING OF CAP

Material

Electrolytic Nickel

Sample Received Date

Nov. 16, 2012

**Testing Period** 

Nov. 16, 2012 to Nov. 19, 2012

**Test Requested** 

As specified by client, to test Lead(Pb), Cadmium(Cd), Mercury(Hg),

Hexavalent Chromium(Cr(VI)) in the submitted sample(s).

### **Test Method**

Test Item(s)	Test Method	Measured Equipment(s)	MDL
Lead(Pb)	Refer to IEC 62321:2008 Ed.1	ICP-OES	2 mg/kg
Cadmium(Cd)	Refer to IEC 62321:2008 Ed.1	ICP-OES	2 mg/kg
Mercury(Hg)	Refer to IEC 62321:2008 Ed.1	ICP-OES	2 mg/kg
Hexavalent Chromium(Cr(VI))	IEC 62321:2008 Ed.1 Annex B	UV-Vis	1

Test Result(s)

Please refer to the following page(s).

Reviewed by Approved by Danny Liu

Nov. 19, 2012

No. 11033098

Centre Testing International (Shenzhen) Co., Ltd. Hongwei Industrial Zone, Bao'an 70 District, Shenzhen, Guangdong, China

400-6788-333 www.cti-cert.com

Technical Manager



## Report No. RLSZE001492100001

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## Test Result(s)

Tested Item(s)	Result	
Lead(Pb)	N.D.	
Cadmium (Cd)	N.D.	
Mercury(Hg)	N.D.	
Hexavalent Chromium(Cr(VI))	Negative	

**Tested Sample/Part Description** 

Silvery plating

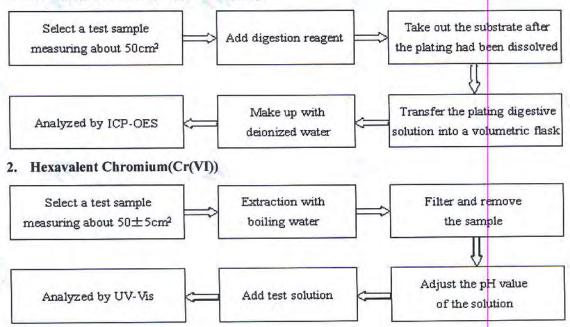
Note:

The washed plating had been dissolved totally tested for Lead, Cadmium,

- -MDL = Method Detection Limit
- -N.D. = Not Detected (<MDL)
- -mg/kg = ppm = parts per million
- -Negative = Absence of Cr(VI), the detected Cr(VI) concentration in the boiling water extraction solution is less than 0.02 mg/kg with 50cm<sup>2</sup> sample surface area used.

### **Test Process**

### 1. Lead(Pb), Cadmium(Cd), Mercury(Hg)





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Photo(s) of the sample(s)



\*\*\* End of report \*\*\*

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號碼(No.): CF/2012/37057 日期(Date): 2012/04/05 頁數(Page): 1 of 11

# **Test Report**

永晉電瓷股份有限公司 / YUEN JINN ELECTRICAL CERAMIC CO., LITD. (永晉宣瓷(蘇州)有限公司 / YUEN JINN ELECTRICAL CERANTC (SUZHOU) CO., [7]).) 新北市樹林區豐林街40號 / NO. 40, FENG LIN ST., SHU LIN DIST., NEW TAIPE! CITY, TAIWAN (江蘇省吳江市松陵鎮江陵西路 / JIANG LING WEST ROAD SONG LING TOWN WU JIANG CITY JIANG SU CHINA P. R. C.)

以下測試樣品係由客户送樣, 且由客户聲稱並經客户確認如下 (The following samples was/were submitted and

樣品名稱(Sample Description)

identified by/on behalf of the client as):

: CERAMIC BASE (陶瓷體)

樣品型號(Style/Item No.)

: YJ50/YJM

批號(Barch No.)

: A28

收件日期(Sample Receiving Date)

: 2012/3/28

測試期間(Testing Period)

: 2012/3/28 TO 2018/04/05

測試結果(Test Results)

請見下一頁 (Please refer to next pages).

結論(Conclusion)

根據客户所提供的樣品。其錫、鉛、汞、六價鉻、多溴聯苯及多溴聯苯醚的測試結果符合 RollS指令2002/95/EC的更新指令9111/65/ED之要求 (Based on the performed tests on submitted samples, the test results of Cadmium, Lead. Mercury. Hexavalent Chromium Cr(VI), PBBs and PBDEs comply with the limits as set by RoHS Directive 2011/65/EU Annex II; recasting 2002/95/EC.)

Chenyu Kung / Signed for and on behalf on SGS TAIWAN LTD. Chemical Laboratory - Taipei

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# **Test Report**

日期(Date): 2012/04/05 頁數(Page): # 11 魏码(No.): CE/2012/37057

永晉電瓷股份有限公司 / YUEN JINN ELECTRICAL GERAMIC CO., LTD. (永晉電瓷(蘇州)有限公司 / YUEN JINN ELECTRICAL CERAMIC (SUZHOU) CO., LTD.) 新北市樹林區豐林街40號 / NO. 40, FENG LIN ST., SHU LIN DIST., NEW TAIPEI CITY, TAIWAN (江蘇省吳江市松陵鎮江陵西路 / JIANG LING WEST ROAD SONG LING TOWN WU JIANG CITY JIANG SH CHINA P. R. C.)

### 测试结果(Test Results)

测试部位(PART NAME)No.1

白色陶瓷 (WHITE CERAMIC)

測試項目 (Test liems)	單位 (Unit)	測試方法 (Method)	方法偵測 極限値 (MDL)	結果 (Result) No.1	法规 限值 (Limis)
鎬 / Cadmium (Cd)	mg/kg	參考HX 62321: 20#8方法, 以感應耦合電	2	n.d.	100
鉛 / Lead (Pb)	mg/kg	業原子發射光譜儀檢測. / With reference to NXC 62321: 2008 and performed by	3	16	1000
汞 / Mercury (Ng)	mg/kg	ICP-AES.	2	n.d.	1000
去價絡 d Hexavalent Chromium Cn(VI)	mg/kg	参考(EC 6232): 2008方法,以UV-VIS檢測, / With reference to IEC 62321: 2008 and performed by UV VIS.	2	n.d.	1000
会換環十二烷 / Hexabromocyclododecane (HBCDD) (CAS No.: 25637-99-4)	mg/kg	參考US EPA 3540C方法,以氣相層析/質譜 儀檢測。/ With reference to US EPA 354UC method, Analysis was performed by GC/MS.	- 5	n.d.	
全氟辛烷磺酸 / Perfluorooctane sulfonates (PFOS-Acid, Metal Sali, Amide)	mg/kg	参考US EPA 3540C: 1996方法,以液相唇析/質譜儀檢測全藏辛烷磺酸含量. / With reference to US EPA 3540C: 1996 method for PPOS Content. Analysis was performed by LC/WS.		n.d.	- 3
全氣辛酸(銨) / PYOA (CAS No.; 335-67-1)	mg/kg	The second secon	-	n.d.	
鄭苯二甲酸甲苯基丁酯 / BBP (Mensyl buryl phihalate) (CAS No.: 85-68-7)	*	參考EN 14372, 以氣相層析/質譜儀檢測之. / With reference to EN 14372, Analysis was performed by GC/MS.	0.003	n.d.	

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# **Test Report**

號碼(No.): CE/2012/37057 頁数(Page): 3 of 11 日期(Date): 2018/04/05

STATES CONTROL OF THE PARTY.

永晉電瓷股份有限公司 / YUEN JINN ELECTRICAL CERAMIC CO., ITO-(永晉電瓷(蘇州)有限公司 / YUEN JINN ELECTRICAL CERAMIC (SUZHOU) CO., LTD.) 新北市樹林區豐林街40號 / NO. 40、FENG LIN ST., SHU LIN DIST., NEW TAIPEI CITY, TAIWAN (江駭省吳江市松陵鎮江陵西路 / J) ANG LING WEST ROAD SONG LING TOWN WU JIANG CITY JIANG SU CHINA P. R. C.)

測試項目 (Test Items)	單位 (Unit)	测试方法 (Method)	方法偵測 極限値 (MDL.)	結果 (Resuli) No.1	決規 限値 (Limit)
鄰苯二甲酸二 (2-乙基己基)酯 / DEHP (Di- (2-sthylhoxyl) phthalate) (CAS No.: 117-81-7)	36	参考EN 14372, 以氣相層析/質譜儀檢測之。 / With reference to EN 14372. Analysis was performed by GC/MS.	0,003	N-W-	-
鄰苯二甲酸二異癸酯 / DIDP (Di- isodecyl phthalate) (CAS No.s 26761-46-0)	Đ,	參考EN 14372, 以氣相層析/質譜儀檢測之. / With reference to EN 14372. Analysis was performed by GC/MS.	0.01	n.d.	3€,
郵苯二甲酸二異去酯 / DINP (Di- isononyl phthalate) (CAS No.: 28553-12-0)	Sign Sign Sign Sign Sign Sign Sign Sign	參考EN 14372。以氣相層析/質譜儀檢測之. / With reference to RN 14372. Analysis was performed by GC/MS.	0.01	nede	÷
鄰苯二甲酸二正辛酯 / DNOP (Di-n- octyl phthalate) (CAS No.: 117- 84-0)	*	多考FN 14372, 以氣相層析/實譜儀檢測之. / With reference to EN 14372. Analysis was performed by GC/MS.	0.003	n.d.	
都苯二甲酸二丁酯 / DBP (Dibuty) phihalate) (CAS No.; 84-74-2)	70.	參考EN 14372, 以氣相層析/質譜儀檢測之。 / With reference to EN 14372. Analysis was performed by GC/MS.		n.d.	
商素 / Halogen					
鹵素 (氣) / Halogen-Pluorine (F) (CAS No.: 14762-94-8)	mg/kg		:5()	n.d.	
鹵素(氦)/ Halogen-Chlorine (CI) (CAS No.: 22537-15-I)	mg/kg	參考RS EN 1/1582:2007、以離子層析儀分析: / With reference to BS EN	50	ग ∍ लें +।	-
鹵素(溴)/ Halogen-Bromine (Br) (CAS No.: 10097-32-2)	mg/kg	14582:2007. Analysis was performed by IC.	:50	n.d.	-
鹵素 (碘) / Halogen-Indine (1) (CAS No.: 14362-44-8)	nig/kg		.50	n.d.	

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**Test Report** 

號稿(No.): CE/2012/37057 日期(Date): 2012/04/05 頁數(Page): 4 of 11

BULLEY TRANSPORT STREET, WAS ALL THE 永會電瓷股份有限公司 / YUEN JINN ELECTRICAL CERAMIC CO., LTD.

(永晉電瓷(蘇州)有限公司 / YUEN JINN ELECTRICAL CERAMIC (SUZHOU) CO., LTD.) 新北市樹林區豐林街40號 / NO. 40、FENG LIN ST., SHU LIN DIST., NEW TAIPEI CITY, TAIWAN (江蘇省吳江市松陵鎮江陵西路 / JIANG LING WEST ROAD SONG LING TOWN WU JIANG CITY JIANG SU CHINA P. R. C.)

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測 極限値	結果 (Result)	法規. 限值
(lest frems)	(duit)	(method)	(MDL.)	No.: I	(Limit.)
多溴磷苯總和 / Sum of PBBs	ng/kg		- 0×0	n.d.	1000
一溴聯苯 / Manabramabiphenyl	mg/kg		5	n.d.	- è -
二溴聯苯 / Dibromobiphenyl	mg/kg		В	क और	4
三溴聯苯 / Tribromobiphenyl	mg/kg		5	ii ali	e_
四溪聯苯 / Tetrabromobiphenyl	mg/kg		5	n.d.	
五溴醇苯 / Pentabromobiphonyl	mg/kg		5	n.d.	1
六溴聯苯 / Hexabramohiphonyl	mg/kg		5	n.d.	
七溴聯苯 / Heptabromobipheny!	ng/kg		5	n.d.	1
八溴聯基 / Octabromobipheoy!	mg/kg		5	n.d.	-
九波聯苯 / Nonabramahijhenyl	mg/kg	a second control of the second control of th	5	n.d.	÷
十溴聯苯 / Decahromolijpheny!	mg/kg	參考IEC 69321: 2008方法, 以氣相層析儀/	5	n.d.	X
多溴聯苯醚總和 / Sum of PBDEs	mg/Rg	質譜儀檢測,/ With reference to LEC 62321: 2008 and performed by GC/MS,	112	m.d.	1000
一溴聯苯醚 / Mamabramadiphenyl ether	mg/kg	uzuzi. sind and periorised by sorner	5	n.d.	
二溴聯苯醚 / Dibrowediphenyl ether -	mg/kg		5	n.d.	7 8
三溴聯苯醚 / Tribromodiphenyl ather	- mg/kg		5	n.d.	100
四溴聯苯醚 / Telrabromodiphecyl ether	mg/kg		6	n.d.	-
五溴聯苯醚 / Pentabramadighenyl ether	mg/kg		5	n.d.	1
六溴聯苯醚 / Hexabromodiphenyl ether	mg/kg		5	n.d.	
七溴醇苯醚 / Heptabromodiphenyl ciber	mg/kg		Đ.	n.d.	1
八溴聯苯醚 / Octabrosodiphenyl other	mg/kg		.57	n.d.	
九溴聯苯醚 / Nanabramadiphenyl other	mg/kg		5	n.d.	1000
十溴哪苯醚 / Decabromodiphonyl ether	mg/kg	1	- Z	mod:	100

### 備註(Note):

1. mg/kg = ppm; 0. (web = 1000ppm

3. n.d. = Not Delected (未检出)

8. MDL = Method Detection Limit (方法侦测極限值)

4, "-" = Not Regulated (無規格值)

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# **Test Report**

號碼(No.): CE/2012/37057 日期(Date): 2012/04/05 頁數(Page): 5 of 1

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PPOS參考資訊(Reference Information): 持久性有機污染物 POPs (EU) 757/2010

PPOS濃度在物質或製備中不得超過0,001%(10ppm),在半成品,成品或零部件中不得超過0.1%(1000ppm),在紡織品或 塗層材料中不得超過Tug/m?。

(Outlawing PPOS as substances or proparations in concentrations above 0.001% (10ppm), in semi-finished products or articles or parts at a level above 0.1%(1000ppm), in textites or other coated materials above lug/m?.)

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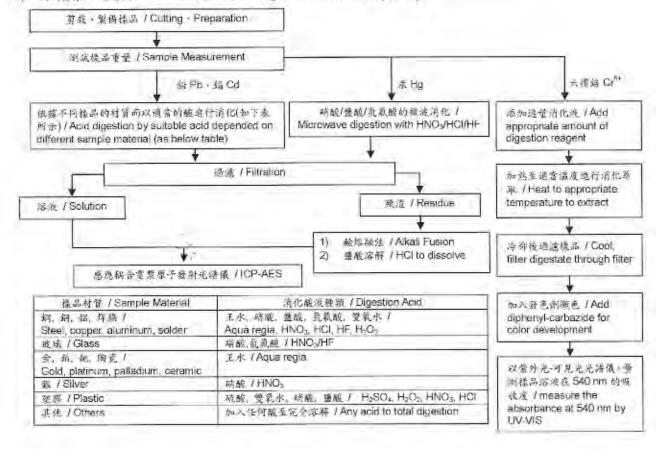
# **Test Report**

號稿(No.): CE/2012/37057 日期(Date); 2012/04/05 頁數(Page); 6 nf II

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SERVICE OF CONTROL SHOWING MADE IN THE

- 根據以下的流程圖之條件,樣品已完全溶解。( 云價格測試方法除外) / These samples were dissolved totally by pre-conditioning method according to below flow chart. ( Cr<sup>2+</sup> test method excluded )
- 测试人员:畸登修 / Name of the person who made measurement: Climbgreat Yang
- 测试负责人: 张序典 / Name of the person in charge of measurement. Troy Chang 3)



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CHINA P. R. C.)

# **Test Report**

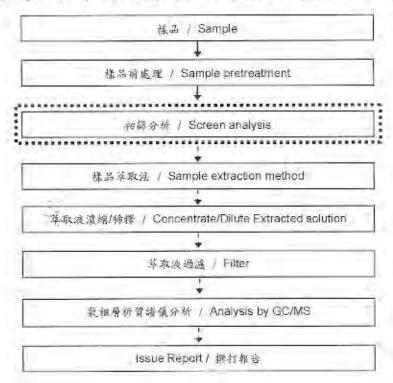
號碼(No.); CE/2012/37057 日期(Date): 2012/04/05 頁数(Page): 7 of 11

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## 分析流程圖 / Analytical flow chart

- 测式人员: 翁賜彬 / Name of the person who made measurement: Roman Wong
- 测试负责人: 张啓與 / Name of the person in charge of measurement: Troy Chang 【测试项目(Test Items): 多溴聯苯/多溴聯苯醚、四溴雙酚-A-雙 / PBB/PBDE, TBBP-A-bis 】

验染测试程序 / First testing process → 連絡技術序 / Optional screen process • • • ● 確認程序 / Confirmation process ← • ▶



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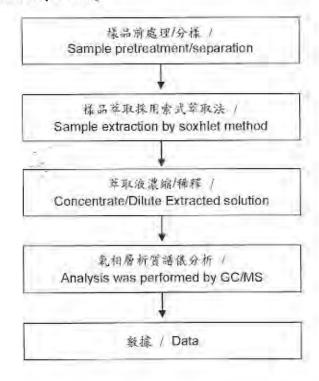
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## 索式萃取分析流程圖 / Analytical flow chart of Soxhlet extraction (GC/MS) procedure

- 割試人員:翁賜夥 / Name of the person who made measurement. Roman Wong
- 測試負責人: 張啓興 / Name of the person in charge of measurement: Troy Chang

【測試項目:可塑劑、苯並三唑類化合物、六溴環十二烷、壬酚、單甲基二溴二苯基甲烷、 有機磷化合物 / Test Items: Phthalate、Benzotriazole、HBCDD、NP、DBBT、Organic phosphorus compounds]



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# **Test Report**

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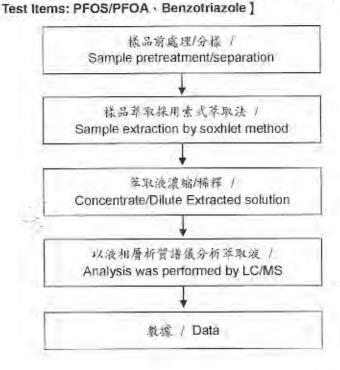
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## 索式萃取分析流程圖 /

## Analytical flow chart of Soxhlet extraction (LC/MS) procedure

- 测载人员: 翁赐彬 / Name of the person who made measurement: Roman Wong
- 测試負責人士張啓興 / Name of the person in charge of measurement: Troy Chang

【測試項目:全氣辛烷磺酸/全氟辛酸(錠)、苯並三唑類化合物/



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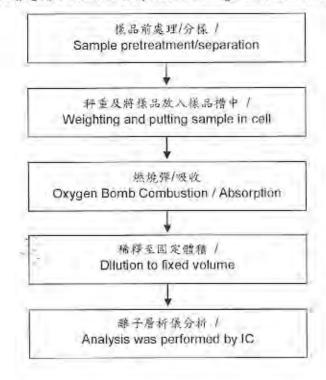
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## 鹵素分析流程圖 / Analytical flow chart of halogen content

- 1) 测試人員: 陳思臻 / Name of the person who made measurement: Rita Chen
- 2) 測試負責人:張啓興 / Name of the person in charge of measurement: Troy Chang



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\* 照片中如有箭頭標示,則表示寫實際檢測之樣品/部位. \* (The tested sample / part is marked by an arrow if it's shown on the photo.)

CE/2012/37057

\*\* 報告結尾 (End of Report) \*\*

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**Test Report** SHAH00361401 Number:

Date:

JAN 16, 2013

Applicant: LITTELFUSE,INC.

800 E. NORTHWEST HWY

A.DIVIETRO/D.UNTIEDT

Sample Description:

One (1) submitted sample said to be Grey Wire.

: Wire Tin Plated Cu. Item Name

Part No. Element.

Tests Conducted:

As requested by the applicant, for details refer to attached page(s).

To be continued

Authorized by:

For intertek testing services Ltd., Shanghai

Jacob Lin

General Manager





**Test Report** SHAH00361401 Number:

#### **Tests Conducted**

### ( I ) Test Result Summary:

<u>Testing Item</u>	Result (ppm)		
	(1)		
Heavy Metal			
Cadmium (Cd) content	ND		
Lead (Pb) content	ND		
Mercury (Hg) content	ND		
Chromium VI (Cr <sup>8+</sup> ) content (mg/kg With 50cm <sup>2</sup> )	Negative (< 0.02)		

<u>Testing Item</u>	Result (ppm)
	(2)
Heavy Metal	
Cadmium (Cd) content / Plating	ND
Lead (Pb) content / Plating	60
Mercury (Hg) content / Plating	ND
Chromium VI (Cr <sup>6+</sup> ) content (mg/kg With 50cm <sup>2</sup> ) / Plating	Negative (< 0.02)

Remarks:

ppm = parts per million = mg/kg

ND = not detected

@ = Due to the insufficient sample area, reduced total sample surface of 10 cm<sup>2</sup> was used and the dilution factor was adjusted accordingly.

mg/kg with 50cm<sup>2</sup> = milligram per kilogram with 50 square centimetre

#### Tested components:

(1)Substrate. (2)Plating.

Responsibility of Chemist: Dent Fang / Ken He

### (II) RoHS Requirement:

Restricted substances	<u>Limits</u>
Cadmium (Cd) Content	0.01% (100ppm)
Lead (Pb) Content	0.1% (1000ppm)
Mercury (Hg) Content	0.1% (1000ppm)
Chromium VI (Cr <sup>o+</sup> ) Content	0.1% (1000ppm)
Polybrominated Biphenyls (PBBs)	0.1% (1000ppm)
Polybrominated Diphenyl Ethers (PBDEs)	0.1% (1000ppm)

The above limits were quoted from RoHS Directive 2011/65/EU for homogeneous material.

### (III) Test Method:

Testing item		Reporting limit
Cadmium (Cd) content	determined by ICP-OES.	2 ppm
Lead (Pb) content	determined by ICP-OES.	2 ppm
Mercury (Hg) content	With reference to IEC 62321 edition 1.0:2008 in clause 7, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Chromium VI (Cr <sup>6+</sup> ) content		0.02 mg/kg with 50cm <sup>2</sup>

Remark: Reporting limit = Quantitation limit of analyze in sample

Date Sample Received: Jan.9, 2013
Testing Period: Jan.9, 2013 to Jan.14, 2013

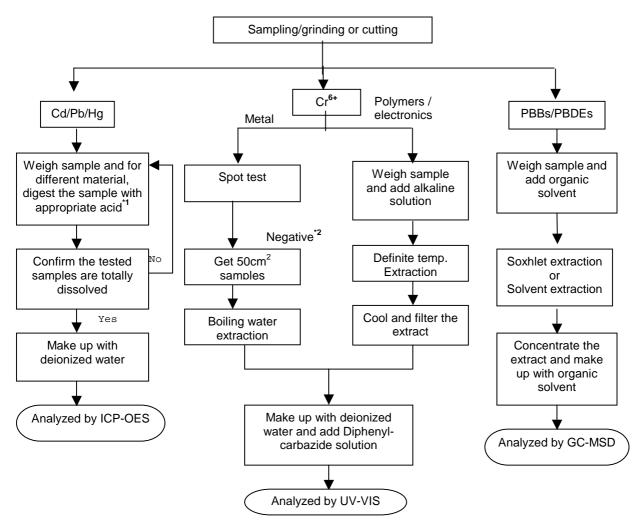
To be continued



Test Report Number: SHAH00361401

Tests Conducted (IV) MEASUREMENT FLOWCHART:

Test for Cd/ Pb/ Hg/Cr (VI)/ PBBs/PBDEs contents Reference standard: IEC 62321 edition 1.0:2008



#### **REMARKS:**

### \*1: LIST OF APPROPRIATE ACID:

7 ALLINOT KIALL AGID.	
MATERIAL	ACID ADDED FOR DIGESTION
Polymers	HNO <sub>3</sub> ,HCI,HF,H <sub>2</sub> O <sub>2</sub> ,H <sub>3</sub> BO <sub>3</sub>
Metals	HNO <sub>3,</sub> HCL,HF
Electronics	HNO <sub>3</sub> ,HCL,H <sub>2</sub> O <sub>2</sub> ,HBF <sub>4</sub>

\*2: IF THE RESULT OF SPOT TEST IS POSITIVE, CHROMIUM (VI) WOULD BE DETERMINED AS DETECTED.

To be continued



**Test Report** SHAH00361401 Number:

**Tests Conducted** 



End of report

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Number: TWNC00294415 Test Report

Applicant: Littelfuse Philippines Inc.

LIMA Technology Center, Lipa City,

Malvar, Batangas

Sample Description:

One (1) group of submitted samples said to be :

Part Description : Tin plated Elcon Wire Element

Part Number : 0042xx/ 0063x : Jan 11, 2013 Date Sample Received : Jan 11, 2013 Date Test Started

Test Conducted:

As requested by the applicant, for details please refer to attached pages.

Authorized by: On Behalf of Intertek Testing Services Taiwan Limited



K. Y. Liang Director



Date : Jan 17, 2013



#### Test Conducted

### ( I ) Test Result Summary:

Test Item	Unit	Togt Mothod	Result		DI
Test Item		<u>Test Method</u>		(2)	<u>RL</u>
Heavy Metal					
Cadmium (Cd) content	ppm	With reference to IEC 62321: 2008, by microwave digestion and determined by ICP-OES.	ND	ND	2
Lead (Pb) content	ppm	With reference to IEC 62321: 2008, by microwave digestion and determined by ICP-OES.	ND	248	2
Mercury (Hg) content	ppm	With reference to IEC 62321: 2008, by microwave digestion and determined by ICP-OES.	ND	ND	2
Chromium VI (Cr <sup>6+</sup> ) content	mg/kg with 50 cm <sup>2</sup>	With reference to IEC 62321: 2008, by boiling water extraction and determined by UV-Vis Spectrophotometer.	Negative	Negative	0.02

ppm = parts per million based on weight of tested sample = mg/kg Remarks:

> = Not detected ND

RL= Reporting Limit, Quantitation limit of analyte in sample mg/kg with  $50cm^2$  = milligram per kilogram with 50 square centimeter

Negative = A negative test result indicated positive observation was not

found at the time of Test. When the spot test showed a negative result, the boiling water extraction procedure shall be used to

verify the result.

### Tested Components

(1) Coppery metal wire base material

(2) Silvery plating layer

Responsibility of Chemist: Kevin Liu/ Irene Chiou

Date Sample Received : Jan 11, 2013

Test Period : Jan 11, 2013 To Jan 15, 2013





#### Test Conducted

### ( ${\rm II}$ ) RoHS Limits:

Restricted Substances	<u>Limits</u>	
Cadmium (Cd) content	0.01% (100ppm)	
Lead (Pb) content	0.1% (1000ppm)	
Mercury (Hg) content	0.1% (1000ppm)	
Chromium VI (Cr <sup>6+</sup> ) content	0.1% (1000ppm)	

The above limits were quoted from Annex II of 2011/65/EU for homogeneous material.

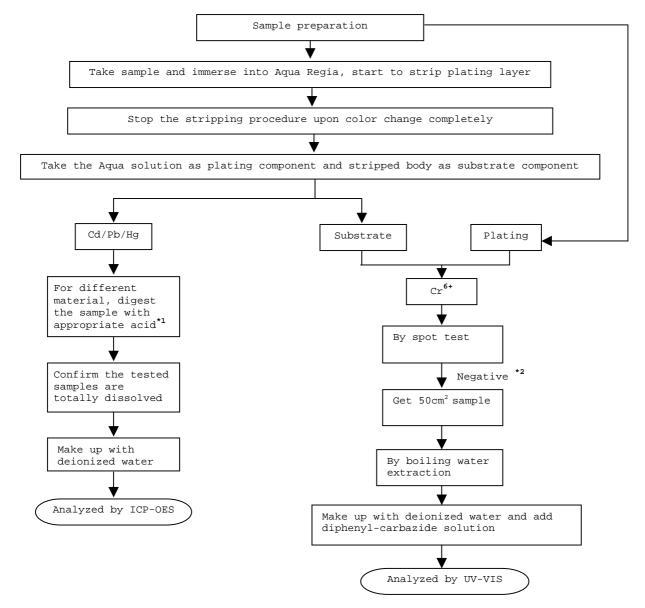


#### Test Conducted

### 

Test For Cd/Pb/Hg/Chromium (VI)

Reference Standard: IEC 62321 edition 1.0:2008







Test Conducted

#### Remarks:

#### \*1: List Of Appropriate Acid:

Material	Acid Added For Digestion
Polymers	$HNO_3$ , $HC1$ , $HF$ , $H_2O_2$ , $H_3BO_3$
Metals	HNO <sub>3,</sub> HCl,HF
Electronics	$HNO_3$ , $HC1$ , $H_2O_2$ , $HBF_4$

\*2: If the result of spot test is positive, Chromium VI would be determined as detected.

End of Report

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Test Conducted

### Number : TWNC00294415

### Photo









**Test Report** Number: SHAH00364112

Applicant: LITTELFUSE,INC. Date: JAN 30, 2013

800 E. NORTHWEST HWY

A.DIVIETRO/D.UNTIEDT

Sample Description:

One(1) submitted sample said to be **Grey Wire.** Item Name : Element.

Part No. : Wire Sn Plated AgCu (687279-001).

Tests Conducted:

As requested by the applicant, for details refer to attached page(s).

To be continued

Authorized by:

For intertek testing services Ltd., Shanghai

Jacob Lin

General Manager





**Test Report** SHAH00364112 Number:

#### **Tests Conducted**

### ( I ) Test Result Summary:

Testing Item	Result (ppm)
Heavy Metal	(1)
Cadmium (Cd) content	ND
Lead (Pb) content	10
Mercury (Hg) content	ND
Chromium VI (Cr <sup>6+</sup> ) content (mg/kg With 50cm <sup>2</sup> )	Negative (< 0.02)

Testing Item	Result (ppm)
Heavy Metal	(2)
Cadmium (Cd) content / Plating	ND
Lead (Pb) content / Plating	70
Mercury (Hg) content / Plating	ND
Chromium VI (Cr <sup>6+</sup> ) content (mg/kg With 50cm <sup>2</sup> ) / Plating	Negative (< 0.02)

Remarks: ppm = parts per million = mg/kg

ND = not detected

mg/kg with 50cm<sup>2</sup> = milligram per kilogram with 50 square centimetre

Negative = A negative test result indicated positive observation was not found at the time of testing.

Tested components:

- (1) Substrate.
- (2) Plating.

Responsibility of Chemist: Dent Fang / Ken He

### (II) RoHS Requirement:

Restricted substances	<u>Limits</u>
Cadmium (Cd) Content	0.01% (100ppm)
Lead (Pb) Content	0.1% (1000ppm)
Mercury (Hg) Content	0.1% (1000ppm)
Chromium VI (Cr <sup>6+</sup> ) Content	0.1% (1000ppm)
Polybrominated Biphenyls (PBBs)	0.1% (1000ppm)
Polybrominated Diphenyl Ethers (PBDEs)	0.1% (1000ppm)

The above limits were quoted from RoHS Directive 2011/65/EU for homogeneous material.

### (III) Test Method:

Testing item	Testing method	Reporting limit
Cadmium (Cd) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Lead (Pb) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Mercury (Hg) content	With reference to IEC 62321 edition 1.0:2008 in clause 7, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Chromium VI (Cr <sup>6+</sup> ) content	With reference to IEC 62321 edition 1.0:2008 in Annex B, by boiling water extraction and determined by UV-VIS Spectrophotometer.	0.02 mg/kg with 50cm <sup>2</sup>

Remark: Reporting limit = Quantitation limit of analyze in sample

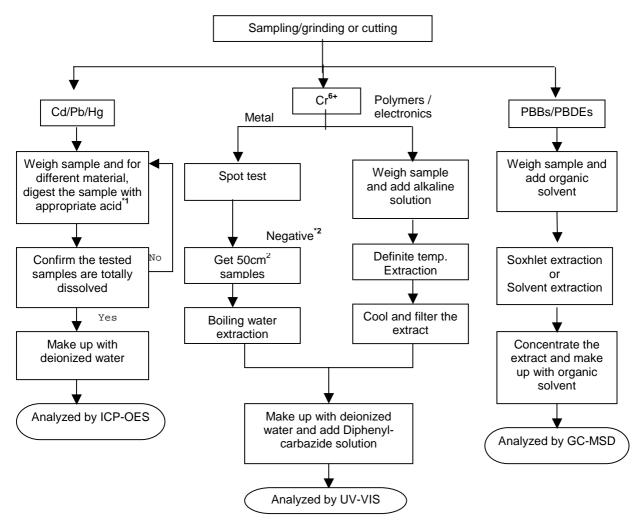
Date Sample Received: Jan.24, 2013 Testing Period: Jan.24, 2013 To Jan.30, 2013

To be continued



Tests Conducted (IV) MEASUREMENT FLOWCHART:

Test for Cd/ Pb/ Hg/Cr (VI)/ PBBs/PBDEs contents Reference standard: IEC 62321 edition 1.0:2008



### **REMARKS:**

\*1: LIST OF APPROPRIATE ACID:

MATERIAL	ACID ADDED FOR DIGESTION
Polymers	HNO <sub>3</sub> ,HCI,HF,H <sub>2</sub> O <sub>2</sub> ,H <sub>3</sub> BO <sub>3</sub>
Metals	HNO <sub>3,</sub> HCL,HF
Electronics	HNO <sub>3</sub> ,HCL,H <sub>2</sub> O <sub>2</sub> ,HBF <sub>4</sub>

\*2: IF THE RESULT OF SPOT TEST IS POSITIVE, CHROMIUM (VI) WOULD BE DETERMINED AS DETECTED.

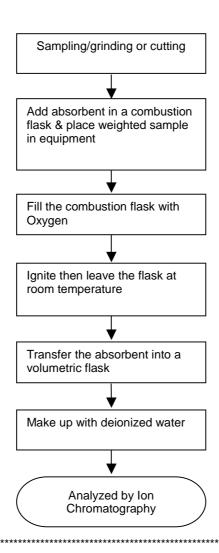
To be continued



**Test Report** SHAH00364112 Number:

**Tests Conducted** 

(V) MEASUREMENT FLOWCHART: Test for Halogen content REFERENCE STANDARD: EN 14582



To be continued



**Tests Conducted** 



To be continued



**Tests Conducted** 



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Date:

JAN 16, 2013

Applicant: LITTELFUSE,INC.

800 E. NORTHWEST HWY

A.DIVIETRO/D.UNTIEDT

Sample Description:

One(1) submitted sample said to be White Yarn.

Item Name : Glass Yarn. Part No. : 648901.

Tests Conducted:

As requested by the applicant, for details refer to attached page(s).

To Be Continued

Authorized by:

For intertek testing services Ltd., Shanghai

Jacob Lin

General Manager





#### **Tests Conducted**

#### (I) Test Result Summary:

Testing Item	Result (ppm)
Heavy Metal	·
Cadmium (Cd) content	ND
Lead (Pb) content	ND
Mercury (Hg) content	ND
Chromium VI (Cr <sup>6+</sup> ) content	ND
Polybrominated Biphenyls (PBBs)	
Monobrominated Biphenyls (MonoBB)	ND
Dibrominated Biphenyls (DiBB)	ND
Tribrominated Biphenyls (TriBB)	ND
Tetrabrominated Biphenyls (TetraBB)	ND
Pentabrominated Biphenyls (PentaBB)	ND
Hexabrominated Biphenyls (HexaBB)	ND
Heptabrominated Biphenyls (HeptaBB)	ND
Octabrominated Biphenyls (OctaBB)	ND
Nonabrominated Biphenyls (NonaBB)	ND
Decabrominated Biphenyl (DecaBB)	ND
Polybrominated Diphenyl Ethers (PBDEs)	
Monobrominated Diphenyl Ethers (MonoBDE)	ND
Dibrominated Diphenyl Ethers (DiBDE)	ND
Tribrominated Diphenyl Ethers (TriBDE)	ND
Tetrabrominated Diphenyl Ethers (TetraBDE)	ND
Pentabrominated Diphenyl Ethers (PentaBDE)	ND
Hexabrominated Diphenyl Ethers (HexaBDE)	ND
Heptabrominated Diphenyl Ethers (HeptaBDE)	ND
Octabrominated Diphenyl Ethers (OctaBDE)	ND
Nonabrominated Diphenyl Ethers (NonaBDE)	ND
Decabrominated Diphenyl Ether (DecaBDE)	ND

Remarks: ppm = parts per million = mg/kg

ND = not detected

Responsibility of Chemist: Dent Fang / Leaf Liu

### (II) RoHS Requirement:

(II) Notice Requirements	
Restricted substances	<u>Limits</u>
Cadmium (Cd) Content	0.01% (100ppm)
Lead (Pb) Content	0.1% (1000ppm)
Mercury (Hg) Content	0.1% (1000ppm)
Chromium VI (Cr <sup>6+</sup> ) Content	0.1% (1000ppm)
Polybrominated Biphenyls (PBBs)	0.1% (1000ppm)
Polybrominated Diphenyl Ethers (PBDEs)	0.1% (1000ppm)

The above limits were quoted from RoHS Directive 2011/65/EU for homogeneous material.



**Tests Conducted** 

### (III) Test Method:

Testing item	Testing method	Reporting limit
Cadmium (Cd) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Lead (Pb) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Mercury (Hg) content	With reference to IEC 62321 edition 1.0:2008 in clause 7, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Chromium VI (Cr <sup>6+</sup> ) content	With reference to IEC 62321 edition 1.0:2008 in annex C, by alkaline digestion and determined by UV-VIS Spectrophotometer.	1 ppm
Polybrominated Biphenyls (PBBs)	With reference to IEC 62321 edition 1.0:2008 in Annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
Polybrominated Diphenyl Ethers (PBDEs)	With reference to IEC 62321 edition 1.0:2008 in Annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm

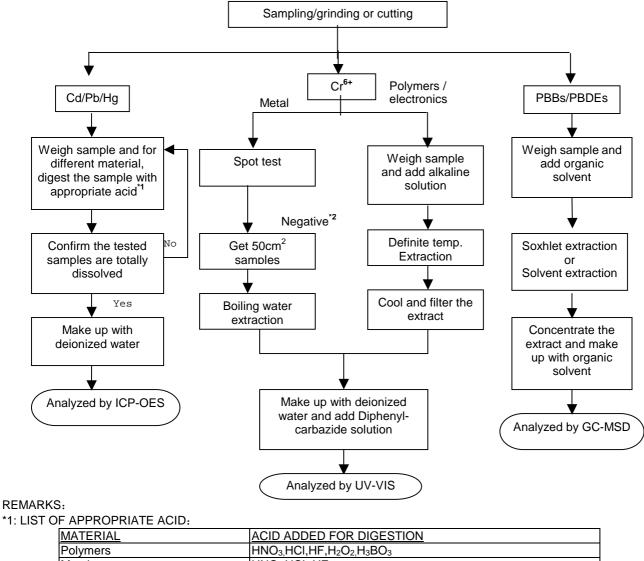
Remark: Reporting limit = Quantitation limit of analyze in sample



**Tests Conducted** 

### (IV) MEASUREMENT FLOWCHART:

Test for Cd/ Pb/ Hg/Cr (VI)/ PBBs/PBDEs contents Reference standard: IEC 62321 edition 1.0:2008



MATERIAL	ACID ADDED FOR DIGESTION
Polymers	HNO <sub>3</sub> ,HCI,HF,H <sub>2</sub> O <sub>2</sub> ,H <sub>3</sub> BO <sub>3</sub>
Metals	HNO <sub>3</sub> ,HCL,HF
Electronics	HNO <sub>3</sub> ,HCL,H <sub>2</sub> O <sub>2</sub> ,HBF <sub>4</sub>

\*2: IF THE RESULT OF SPOT TEST IS POSITIVE, CHROMIUM (VI) WOULD BE DETERMINED AS DETECTED.



#### **Tests Conducted**

#### 2 Halogen content

( I ) Test result summary:

Testing item	Result (ppm)
Fluorine (F)	350
Chlorine (CI)	150
Bromine (Br)	ND
lodine (I)	ND

Remarks: ppm = parts per million = mg/kg

ND = Not detected

Responsibility of chemist: Grave Wang

### (II) Test method:

Testing item	Testing method	Reporting limit
IHAINNEN CONTENT	With reference to EN 14582: 2007 by combustion flask with oxygen and determined by ion chromatography	50 ppm

Remark: Reporting limit = quantitation limit of analyte in sample

Date sample received: Jan.8, 2013

Testing period: Jan.8, 2013 To Jan.14, 2013

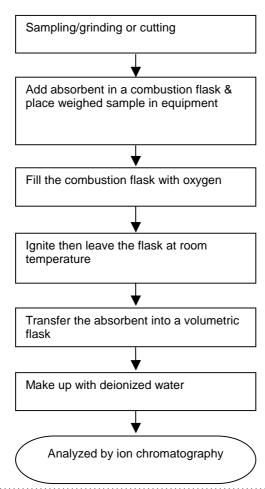


**Test Report** SHAH00361375 Number:

**Tests Conducted** 

### (III) MEASUREMENT FLOWCHART:

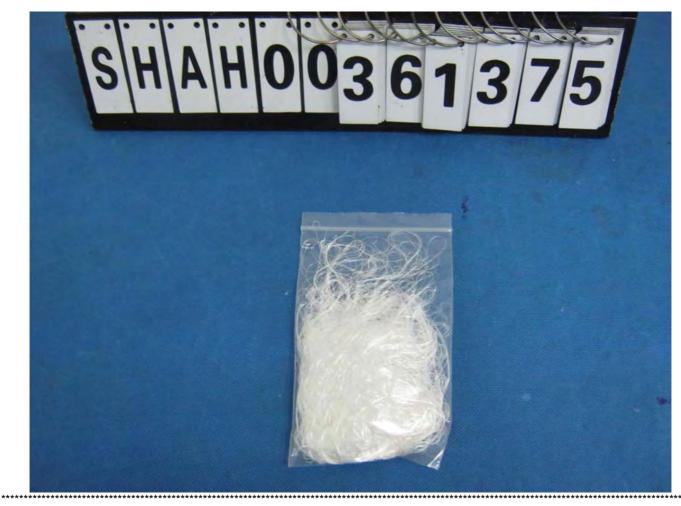
Test for halogen content REFERENCE STANDARD: EN 14582





**Test Report** SHAH00361375 Number:

**Tests Conducted** 



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**Test Report** No. SHAEC1216714751 Date: 25 Sep 2012 Page 1 of 5

ZHEJIANG ASIA GENERAL SOLDERING&BRAZING MATERIAL CO., LTD XIHU INDUSTRIAL PARK, SANDUN, HANGZHOU CITY, ZHEJIANG, PROVINCE, CHINA

The following sample(s) was/were submitted and identified on behalf of the clients as: ORGANIC ACTIVE

**FLUX** 

SGS Job No.: SP12-028285 - SH Part No. (P/N):

Composition: ORGANIC ACID RESIN WETTING AGENT CORROSION

INNIBITOR, SOLVENT

YT-09 (195116)

Date of Sample Received: 21 Sep 2012

Testing Period: 21 Sep 2012 - 25 Sep 2012

Test Requested: Selected test(s) as requested by client.

Test Method: Please refer to next page(s). Test Results: Please refer to next page(s).

Conclusion: Based on the performed tests on submitted samples, the results of Lead,

> Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBB), Polybrominated diphenyl ethers (PBDE) comply with the limits as set by RoHS

Directive 2011/65/EU Annex II; recasting 2002/95/EC.

Signed for and on behalf of SGS-CSTC Ltd.

Fan Jingjie, JJ Approved Signatory

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e sgs.china@sgs.com



No. SHAEC1216714751

Date: 25 Sep 2012

Page 2 of 5

Test Results:

Test Part Description:

Specimen No. SGS Sample ID Description

1 SHA12-167147.044 Orange liquid

Remarks:

(1) 1 mg/kg = 1 ppm = 0.0001%

(2) MDL = Method Detection Limit

(3) ND = Not Detected ( < MDL)

(4) "-" = Not Regulated

# RoHS Directive 2011/65/EU

Test Method: With reference to IEC 62321:2008

(1) Determination of Cadmium by ICP-OES.

(2) Determination of Lead by ICP-OES.

(3) Determination of Mercury by ICP-OES.

(4) Determination of Hexavalent Chromium by Colorimetric Method using UV-Vis.

(5) Determination of PBBs / PBDEs content by GC-MS.

Test Item(s)	<u>Limit</u>	<u>Unit</u>	MDL	044
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1000	mg/kg	2	ND
Mercury (Hg)	1000	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))	1000	mg/kg	2	ND
Sum of PBBs	1000	mg/kg	-	ND
Monobromobiphenyl	-	mg/kg	5	ND
Dibromobiphenyl	-	mg/kg	5	ND
Tribromobiphenyl	8	mg/kg	5	ND
Tetrabromobiphenyl	-	mg/kg	5	ND
Pentabromobiphenyl	100	mg/kg	5	ND
Hexabromobiphenyl		mg/kg	5	ND
Heptabromobiphenyl		mg/kg	5	ND
Octabromobiphenyl	-	mg/kg	5	ND
Nonabromobiphenyl	+	mg/kg	5	ND
Decabromobiphenyl	\-	mg/kg	5	ND
Sum of PBDEs	1000	mg/kg	- 15	ND
Monobromodiphenyl ether	-	mg/kg	5	ND

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Test Report	No. SHAEC12167147	51	Date: 25	Sep 2012	Page 3 of 5
Test Item(s)	Limit	<u>Unit</u>	MDL	044	
Dibromodiphenyl ether		mg/kg	5	ND	
Tribromodiphenyl ether	4	mg/kg	5	ND	
Tetrabromodiphenyl ether	÷	mg/kg	5	ND	
Pentabromodiphenyl ether		mg/kg	5	ND	
Hexabromodiphenyl ether	1.5	mg/kg	5	ND	
Heptabromodiphenyl ether	1.3/	mg/kg	5	ND	
Octabromodiphenyl ether	-	mg/kg	5	ND	
Nonabromodiphenyl ether		mg/kg	5	ND	
Decabromodiphenyl ether	9	mg/kg	5	ND	

### Notes:

- (1) The maximum permissible limit is quoted from directive 2011/65/EU, Annex II
- (2) Result shown is of the total weight of wet sample.

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No. SHAEC1216714751

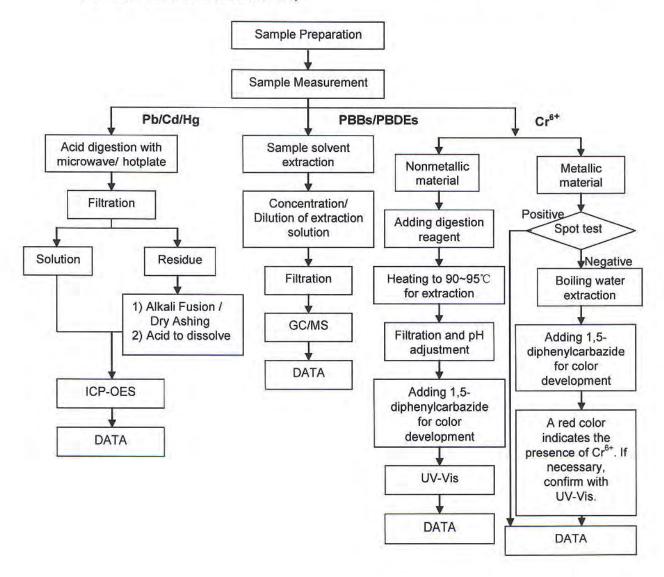
Date: 25 Sep 2012

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### **ATTACHMENTS**

### **RoHS Testing Flow Chart**

- 1) Name of the person who made testing: Jan Shi/Yoyo Wang/Allen Xiao/Gary Xu
- 2) Name of the person in charge of testing: Jeff Zhang/George Xu/ Linda Li
- These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr<sup>6+</sup> and PBBs/PBDEs test method excluded)



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No. SHAEC1216714751

Date: 25 Sep 2012

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Sample photo:



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No. SHAEC1216714750

Date: 25 Sep 2012

Page 1 of 5

ZHEJIANG ASIA GENERAL SOLDERING&BRAZING MATERIAL CO., LTD XIHU INDUSTRIAL PARK, SANDUN, HANGZHOU CITY, ZHEJIANG, PROVINCE, CHINA

The following sample(s) was/were submitted and identified on behalf of the clients as: LEAD-FREE SOLDER WIRE

SGS Job No. :

SP12-028285 - SH

Part No. (P/N):

YTW102 (692539-002)

Composition:

Sn2.0CuRE

Date of Sample Received:

21 Sep 2012

Testing Period:

21 Sep 2012 - 25 Sep 2012

Test Requested:

Selected test(s) as requested by client.

Test Method:

Please refer to next page(s).

Test Results:

Please refer to next page(s).

Conclusion:

Based on the performed tests on submitted samples, the results of Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBB), Polybrominated diphenyl ethers (PBDE) comply with the limits as set by RoHS

Directive 2011/65/EU Annex II; recasting 2002/95/EC.

Signed for and on behalf of SGS-CSTC Ltd.

Fan Jingjie, JJ Approved Signatory

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No. SHAEC1216714750

Date: 25 Sep 2012

Page 2 of 5

Test Results:

# Test Part Description:

Specimen No. SGS Sample ID Description SHA12-167147.043 Silvery wire

#### Remarks:

(1) 1 mg/kg = 1 ppm = 0.0001%

(2) MDL = Method Detection Limit

(3) ND = Not Detected ( < MDL )

(4) "-" = Not Regulated

### RoHS Directive 2011/65/EU

Test Method: With reference to IEC 62321:2008

(1) Determination of Cadmium by ICP-OES.

(2) Determination of Lead by ICP-OES.

(3) Determination of Mercury by ICP-OES.

(4) Determination of Hexavalent Chromium by Spot test / Colorimetric Method using UV-Vis.

(5) Determination of PBBs / PBDEs by GC-MS.

Test Item(s)	<u>Limit</u>	<u>Unit</u>	MDL	043
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1000	mg/kg	2	168
Mercury (Hg)	1000	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))	-	-	<b>\Q</b>	Negative
Sum of PBBs	1000	mg/kg	-	ND
Monobromobiphenyl	-	mg/kg	5	ND
Dibromobiphenyl	4	mg/kg	5	ND
Tribromobiphenyl	*	mg/kg	5	ND
Tetrabromobiphenyl	4	mg/kg	5	ND
Pentabromobiphenyl	2	mg/kg	5	ND
Hexabromobiphenyl	-	mg/kg	5	ND
Heptabromobiphenyl	-	mg/kg	5	ND
Octabromobiphenyl	- 2	mg/kg	5	ND
Nonabromobiphenyl	=	mg/kg	5	ND
Decabromobiphenyl	2	mg/kg	5	ND
Sum of PBDEs	1000	mg/kg	-	ND
Monobromodiphenyl ether	-	mg/kg	5	ND

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Test Report	No. SHAEC121671475	50	Date: 25	Sep 2012	Page 3 of 5
Test Item(s)	<u>Limit</u>	<u>Unit</u>	MDL	<u>043</u>	
Dibromodiphenyl ether	The state of the s	mg/kg	5	ND	
Tribromodiphenyl ether	Sian .	mg/kg	5	ND	
Tetrabromodiphenyl ether		mg/kg	5	ND	
Pentabromodiphenyl ether	, i	mg/kg	5	ND	
Hexabromodiphenyl ether	4	mg/kg	5	ND	
Heptabromodiphenyl ether	4	mg/kg	5	ND	
Octabromodiphenyl ether	-	mg/kg	5	ND	
Nonabromodiphenyl ether		mg/kg	5	ND	
Decabromodiphenyl ether	-	mg/kg	5	ND	

### Notes:

- (1) The maximum permissible limit is quoted from directive 2011/65/EU, Annex II
- (2) Spot-test:

Negative = Absence of Cr(VI) coating, Positive = Presence of Cr(VI) coating;

(The tested sample should be further verified by boiling-water-extraction method if the spot test result is Negative or cannot be confirmed.)

◇Boiling-water-extraction:

Negative = Absence of Cr(VI) coating

Positive = Presence of Cr(VI) coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm² sample surface area.

For corrosion protection coatings on metals: Information on storage conditions and production date of the tested sample is unavailable and thus results of Cr(VI) represent status of the sample at the time of testing.

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No. SHAEC1216714750

Date: 25 Sep 2012

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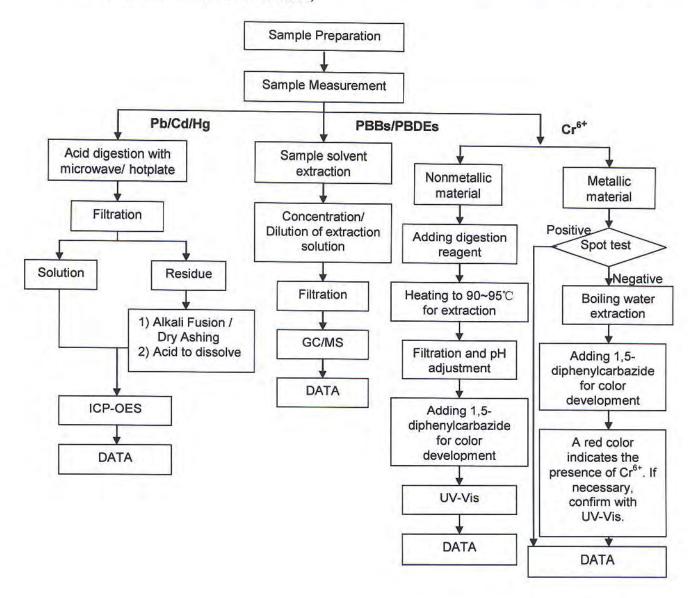
### **ATTACHMENTS**

### **RoHS Testing Flow Chart**

1) Name of the person who made testing: Jan Shi/Yoyo Wang/Allen Xiao/Gary Xu

2) Name of the person in charge of testing: Jeff Zhang/George Xu/ Linda Li

These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr<sup>6+</sup> and PBBs/PBDEs test method excluded)



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Date: 25 Sep 2012

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Sample photo:



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Date: 25 Sep 2012

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ZHEJIANG ASIA GENERAL SOLDERING&BRAZING MATERIAL CO., LTD
XIHU INDUSTRIAL PARK, SANDUN, HANGZHOU CITY, ZHEJIANG, PROVINCE, CHINA

The following sample(s) was/were submitted and identified on behalf of the clients as : LEAD-FREE SOLDER WIRE

SGS Job No. : SP12-028285 - SH

Part No. (P/N): YTW206

Composition : Sn0.3Ag0.7CuCe

Date of Sample Received : 21 Sep 2012

Testing Period : 21 Sep 2012 - 25 Sep 2012

Test Requested : Selected test(s) as requested by client.

Test Method: Please refer to next page(s).

Test Results: Please refer to next page(s).

Conclusion: Based on the performed tests on submitted samples, the results of Lead,

Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBB), Polybrominated diphenyl ethers (PBDE) comply with the limits as set by RoHS

Directive 2011/65/EU Annex II; recasting 2002/95/EC.

Signed for and on behalf of SGS-CSTC Ltd.

Fan Jingjie, JJ Approved Signatory

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No. SHAEC1216714738

Date: 25 Sep 2012

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Test Results:

### Test Part Description:

Specimen No. SGS Sample ID Description
1 SHA12-167147.035 Silvery wire

Remarks:

(1) 1 mg/kg = 1 ppm = 0.0001%

(2) MDL = Method Detection Limit

(3) ND = Not Detected ( < MDL)

(4) "-" = Not Regulated

### RoHS Directive 2011/65/EU

Test Method: With reference to IEC 62321:2008

(1) Determination of Cadmium by ICP-OES.

(2) Determination of Lead by ICP-OES.

(3) Determination of Mercury by ICP-OES.

(4) Determination of Hexavalent Chromium by Spot test / Colorimetric Method using UV-Vis.

(5) Determination of PBBs / PBDEs by GC-MS.

Test Item(s)	<u>Limit</u>	<u>Unit</u>	MDL	<u>035</u>
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1000	mg/kg	2	50
Mercury (Hg)	1000	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))			$\Diamond$	Negative
Sum of PBBs	1000	mg/kg	B.	ND
Monobromobiphenyl	9	mg/kg	5	ND
Dibromobiphenyl	4	mg/kg	5	ND
Tribromobiphenyl	4	mg/kg	5	ND
Tetrabromobiphenyl	0-1	mg/kg	5	ND
Pentabromobiphenyl	-	mg/kg	5	ND
Hexabromobiphenyl		mg/kg	5	ND
Heptabromobiphenyl	2.1	mg/kg	5	ND
Octabromobiphenyl	-	mg/kg	5	ND
Nonabromobiphenyl	-	mg/kg	5	ND
Decabromobiphenyl	191	mg/kg	5	ND
Sum of PBDEs	1000	mg/kg	-	ND
Monobromodiphenyl ether	-	mg/kg	5	ND

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Test Report	No. SHAEC1216714738		Date: 25 Sep 2012		Page 3 of 5
Test Item(s)	<u>Limit</u>	<u>Unit</u>	MDL	<u>035</u>	
Dibromodiphenyl ether	1.0	mg/kg	5	ND	
Tribromodiphenyl ether	-	mg/kg	5	ND	
Tetrabromodiphenyl ether		mg/kg	5	ND	
Pentabromodiphenyl ether		mg/kg	5	ND	
Hexabromodiphenyl ether	-	mg/kg	5	ND	
Heptabromodiphenyl ether	-	mg/kg	5	ND	
Octabromodiphenyl ether		mg/kg	5	ND	
Nonabromodiphenyl ether		mg/kg	5	ND	
Decabromodiphenyl ether	4	mg/kg	5	ND	

### Notes:

- (1) The maximum permissible limit is quoted from directive 2011/65/EU, Annex II
- (2) \$Spot-test:

Negative = Absence of Cr(VI) coating, Positive = Presence of Cr(VI) coating;

(The tested sample should be further verified by boiling-water-extraction method if the spot test result is Negative or cannot be confirmed.)

◇Boiling-water-extraction:

Negative = Absence of Cr(VI) coating

Positive = Presence of Cr(VI) coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm² sample surface area.

For corrosion protection coatings on metals: Information on storage conditions and production date of the tested sample is unavailable and thus results of Cr(VI) represent status of the sample at the time of testing.

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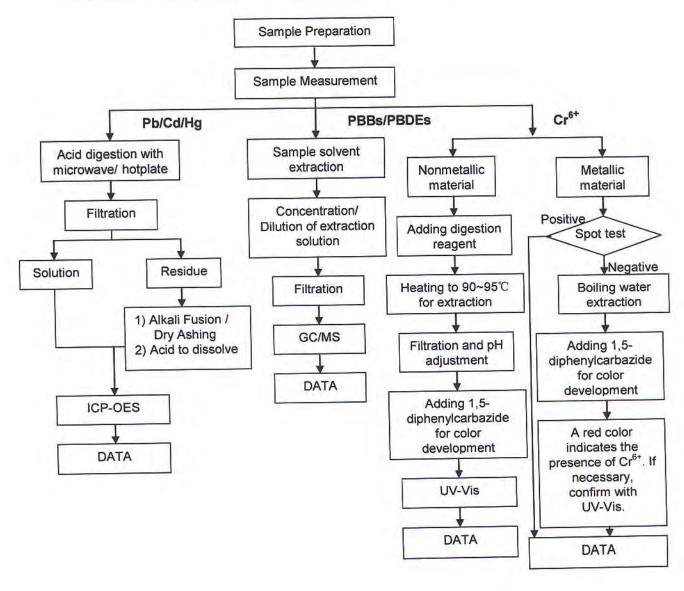
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### **ATTACHMENTS**

# **RoHS Testing Flow Chart**

- 1) Name of the person who made testing: Jan Shi/Yoyo Wang/Allen Xiao/Gary Xu
- 2) Name of the person in charge of testing: Jeff Zhang/George Xu/ Linda Li
- These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr<sup>6+</sup> and PBBs/PBDEs test method excluded)



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ZHEJIANG ASIA GENERAL SOLDERING&BRAZING MATERIAL CO., LTD
XIHU INDUSTRIAL PARK, SANDUN, HANGZHOU CITY, ZHEJIANG, PROVINCE, CHINA

The following sample(s) was/were submitted and identified on behalf of the clients as : LEAD-FREE SOLDER WIRE

SGS Job No. : SP12-028285 - SH

Part No. (P/N): YTW206

Composition : Sn0.3Ag0.7CuCe

Date of Sample Received : 21 Sep 2012

Testing Period : 21 Sep 2012 - 25 Sep 2012

Test Requested : Selected test(s) as requested by client.

Test Method: Please refer to next page(s).

Test Results: Please refer to next page(s).

Conclusion: Based on the performed tests on submitted samples, the results of Lead,

Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBB), Polybrominated diphenyl ethers (PBDE) comply with the limits as set by RoHS

Directive 2011/65/EU Annex II; recasting 2002/95/EC.

Signed for and on behalf of SGS-CSTC Ltd.

Fan Jingjie, JJ Approved Signatory

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No. SHAEC1216714738

Date: 25 Sep 2012

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Test Results:

### Test Part Description:

Specimen No. SGS Sample ID Description
1 SHA12-167147.035 Silvery wire

Remarks:

(1) 1 mg/kg = 1 ppm = 0.0001%

(2) MDL = Method Detection Limit

(3) ND = Not Detected ( < MDL)

(4) "-" = Not Regulated

### RoHS Directive 2011/65/EU

Test Method: With reference to IEC 62321:2008

(1) Determination of Cadmium by ICP-OES.

(2) Determination of Lead by ICP-OES.

(3) Determination of Mercury by ICP-OES.

(4) Determination of Hexavalent Chromium by Spot test / Colorimetric Method using UV-Vis.

(5) Determination of PBBs / PBDEs by GC-MS.

Test Item(s)	<u>Limit</u>	<u>Unit</u>	MDL	<u>035</u>
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1000	mg/kg	2	50
Mercury (Hg)	1000	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))			$\Diamond$	Negative
Sum of PBBs	1000	mg/kg	B.	ND
Monobromobiphenyl	9	mg/kg	5	ND
Dibromobiphenyl	4	mg/kg	5	ND
Tribromobiphenyl	4	mg/kg	5	ND
Tetrabromobiphenyl	0-1	mg/kg	5	ND
Pentabromobiphenyl	-	mg/kg	5	ND
Hexabromobiphenyl		mg/kg	5	ND
Heptabromobiphenyl	2.1	mg/kg	5	ND
Octabromobiphenyl	-	mg/kg	5	ND
Nonabromobiphenyl	-	mg/kg	5	ND
Decabromobiphenyl	191	mg/kg	5	ND
Sum of PBDEs	1000	mg/kg	-	ND
Monobromodiphenyl ether	-	mg/kg	5	ND

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Test Report	No. SHAEC1216714738		Date: 25 Sep 2012		Page 3 of 5
Test Item(s)	<u>Limit</u>	<u>Unit</u>	MDL	<u>035</u>	
Dibromodiphenyl ether	1.0	mg/kg	5	ND	
Tribromodiphenyl ether	-	mg/kg	5	ND	
Tetrabromodiphenyl ether		mg/kg	5	ND	
Pentabromodiphenyl ether		mg/kg	5	ND	
Hexabromodiphenyl ether	-	mg/kg	5	ND	
Heptabromodiphenyl ether	-	mg/kg	5	ND	
Octabromodiphenyl ether		mg/kg	5	ND	
Nonabromodiphenyl ether		mg/kg	5	ND	
Decabromodiphenyl ether	4	mg/kg	5	ND	

### Notes:

- (1) The maximum permissible limit is quoted from directive 2011/65/EU, Annex II
- (2) \$Spot-test:

Negative = Absence of Cr(VI) coating, Positive = Presence of Cr(VI) coating;

(The tested sample should be further verified by boiling-water-extraction method if the spot test result is Negative or cannot be confirmed.)

◇Boiling-water-extraction:

Negative = Absence of Cr(VI) coating

Positive = Presence of Cr(VI) coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm² sample surface area.

For corrosion protection coatings on metals: Information on storage conditions and production date of the tested sample is unavailable and thus results of Cr(VI) represent status of the sample at the time of testing.

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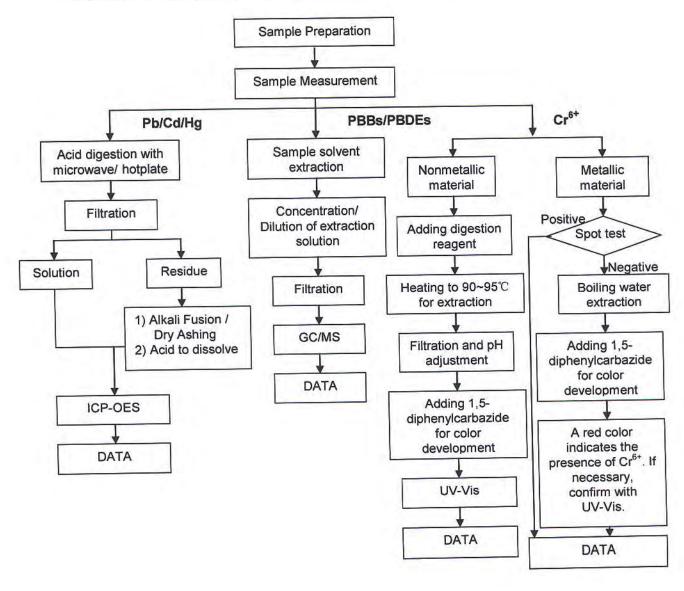
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### **ATTACHMENTS**

# **RoHS Testing Flow Chart**

- 1) Name of the person who made testing: Jan Shi/Yoyo Wang/Allen Xiao/Gary Xu
- 2) Name of the person in charge of testing: Jeff Zhang/George Xu/ Linda Li
- These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr<sup>6+</sup> and PBBs/PBDEs test method excluded)



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No. SHAEC1207780402

Date: 22 May 2012

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DONGGUAN CITY XINHAI METAL PRODUCTS CO.,LTD

1ST WEIMING ROAD HENGZENG AV.XINAN COMMUNITY CHANGAN TOWN DONGGUAN CITY GUANGDONG PROVINCE

The following sample(s) was/were submitted and identified on behalf of the clients as: BASE OF CAP

SGS Job No.:

SP12-014327 - SH

Composition:

**BRASS** 

Date of Sample Received :

17 May 2012

Testing Period:

17 May 2012 - 22 May 2012

Test Requested:

Selected test(s) as requested by client.

Test Method:

Please refer to next page(s).

Test Results:

Please refer to next page(s).

Conclusion:

Based on the performed tests on selected part of submitted sample(s), the

results of Lead, Mercury, Cadmium, Hexavalent chromium comply with the limits

in RoHS Directive 2011/65/EU Annex II; recasting 2002/95/EC.

Signed for and on behalf of SGS-CSTC Ltd.

Fan Jingjie, JJ Approved Signatory

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No. SHAEC1207780402

Date: 22 May 2012

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Test Results:

Test Part Description:

Specimen No. SGS Sample ID

Description

1

SHA12-077804.002

Silvery metal

Remarks:

(1) 1 mg/kg = 1 ppm = 0.0001%

(2) MDL = Method Detection Limit

(3) ND = Not Detected ( < MDL)

(4) "-" = Not Regulated

### RoHS Directive 2011/65/EU

Test Method: With reference to IEC 62321:2008

(1) Determination of Cadmium by ICP-OES.

(2) Determination of Lead by ICP-OES.

(3) Determination of Mercury by ICP-OES.

(4) Determination of Hexavalent Chromium by spot test / Colorimetric Method using UV-Vis

Toot Itom(a)			Limit	1 lmit	MDI	002
Test Item(s)			<u>Limit</u>	<u>Unit</u>	MDL	002
Cadmium (Cd)	\$	•	100	mg/kg	2	ND 3
Lead (Pb)			1000	mg/kg	2	9
Mercury (Hg)			1000	mg/kg	2	ND
Hexavalent Chromium (	Cr(VI))		-	_	<b>\Q</b>	Negative

#### Notes:

- (1) The maximum permissible limit is quoted from directive 2011/65/EU, Annex II
- (2) Spot-test:

Negative = Absence of Cr(VI) coating, Positive = Presence of Cr(VI) coating;

(The tested sample should be further verified by boiling-water-extraction method if the spot test result is Negative or cannot be confirmed.)

◇Boiling-water-extraction:

Negative = Absence of Cr(VI) coating

Positive = Presence of Cr(VI) coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm² sample surface area.

For corrosion protection coatings on metals: Information on storage conditions and production date of the tested sample is unavailable and thus results of Cr(VI) represent status of the sample at the time of testing.

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No. SHAEC1207780402

Date: 22 May 2012

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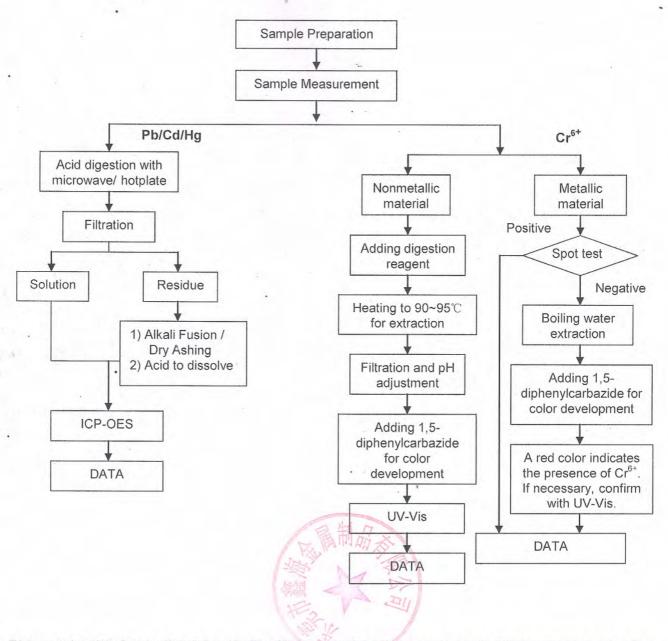
### **ATTACHMENTS**

### **RoHS Testing Flow Chart**

1) Name of the person who made testing: Jan Shi/Yoyo Wang/Allen Xiao

2) Name of the person in charge of testing: Jeff Zhang/George Xu

3) These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr<sup>6+</sup> test method excluded)



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Date: 22 May 2012

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DONGGUAN CITY XINHAI METAL PRODUCTS CO.,LTD

1ST WEIMING ROAD HENGZENG AV.XINAN COMMUNITY CHANGAN TOWN DONGGUAN CITY GUANGDONG PROVINCE

The following sample(s) was/were submitted and identified on behalf of the clients as : SILVER COLOR PLATING OF CAP

SGS Job No.:

SP12-014327 - SH

Composition:

NICKEL

Date of Sample Received:

17 May 2012

Testing Period:

17 May 2012 - 22 May 2012

Test Requested:

Selected test(s) as requested by client.

Test Method:

Please refer to next page(s).

Test Results:

Please refer to next page(s).

Conclusion:

Based on the performed tests on selected part of submitted sample(s), the

results of Lead, Mercury, Cadmium, Hexavalent chromium comply with the limits

in RoHS Directive 2011/65/EU Annex II; recasting 2002/95/EC.

Signed for and on behalf of SGS-CSTC Ltd.

Fan Jingjie, JJ Approved Signatory

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No. SHAEC1207780404

Date: 22 May 2012

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Test Results:

Test Part Description:

Specimen No.

SGS Sample ID

Description

SHA12-077804.004

Silvery metal plating

Remarks:

(1) 1 mg/kg = 1 ppm = 0.0001%

(2) MDL = Method Detection Limit

(3) ND = Not Detected ( < MDL )

(4) "-" = Not Regulated

## RoHS Directive 2011/65/EU

Test Method: (1) IEC 62321:2008 application of modified digestion by surface etching for Cadmium, Lead and

Mercury, analysis by ICP-OES

(2) With reference to IEC 62321:2008 for Hexavalent Chromium by spot test / Colorimetric

Method.

Test Item(s)		Limit	<u>Unit</u>	MDL	004
Lead (Pb)		1000	mg/kg	10	27
Cadmium (Cd)	-	100	mg/kg	10	ND ND
Mercury (Hg)		1000	mg/kg	10	ND
Hexavalent Chromium (CrVI)		-	-	0	Negative

### Notes:

(1) The maximum permissible limit is quoted from directive 2011/65/EU, Annex II

(2) Spot-test:

Negative = Absence of CrVI coating, Positive = Presence of CrVI coating;

The tested sample should be further verified by boiling-water-extraction method if the spot test result is Negative or cannot be confirmed.

Boiling-water-extraction:

Negative = Absence of CrVI coating; Positive = Presence of CrVI coating

The detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm2 sample surface area.

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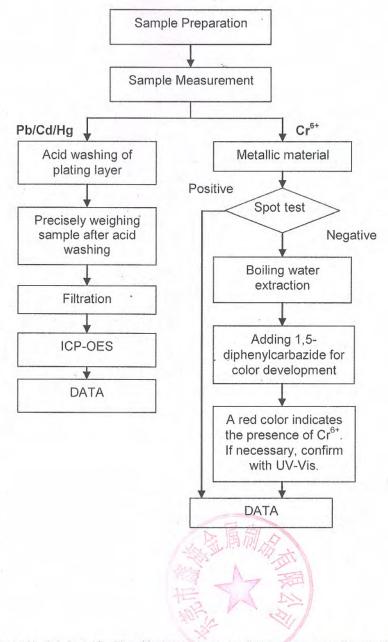
Date: 22 May 2012

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### **ATTACHMENTS**

# Plating Pb/Cd/Hg/Cr6+ Testing Flow Chart

- 1) Name of the person who made testing: Vera Liu/Allen Xiao
- 2) Name of the person in charge of testing: Jeff Zhang/George Xu



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Date: 22 May 2012

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No. SHAEC1207780401

Date: 22 May 2012

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DONGGUAN CITY XINHAI METAL PRODUCTS CO.,LTD

1ST WEIMING ROAD HENGZENG AV.XINAN COMMUNITY CHANGAN TOWN DONGGUAN CITY GUANGDONG PROVINCE

The following sample(s) was/were submitted and identified on behalf of the clients as: BASE OF LEAD WIRE

SGS Job No.:

SP12-014327 - SH

Composition:

COPPER

Date of Sample Received:

17 May 2012

Testing Period:

17 May 2012 - 22 May 2012

Test Requested:

Selected test(s) as requested by client.

Test Method:

Please refer to next page(s).

Test Results:

Please refer to next page(s).

Conclusion:

Based on the performed tests on selected part of submitted sample(s), the

results of Lead, Mercury, Cadmium, Hexavalent chromium comply with the limits

in RoHS Directive 2011/65/EU Annex II; recasting 2002/95/EC.

Signed for and on behalf of SGS-CSTC Ltd.

Fan Jingjie, JJ Approved Signatory

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No. SHAEC1207780401

Date: 22 May 2012

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Test Results:

Test Part Description:

Specimen No. SGS Sample ID

Description

1

SHA12-077804.001

Silvery metal

Remarks:

(1) 1 mg/kg = 1 ppm = 0.0001%

(2) MDL = Method Detection Limit

(3) ND = Not Detected ( < MDL )

(4) "-" = Not Regulated

### RoHS Directive 2011/65/EU

Test Method: With reference to IEC 62321:2008

(1) Determination of Cadmium by ICP-OES.

(2) Determination of Lead by ICP-OES.

(3) Determination of Mercury by ICP-OES.

(4) Determination of Hexavalent Chromium by spot test / Colorimetric Method using UV-Vis.

Test Item(s)	1	Limit	<u>Unit</u>	MDL	001
Cadmium (Cd)		100	mg/kg	2	ND
Lead (Pb)		1000	mg/kg	2	ND
Mercury (Hg)		1000	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))		-	-	0	Negative

#### Notes:

- (1) The maximum permissible limit is quoted from directive 2011/65/EU, Annex II
- (2) Spot-test:

Negative = Absence of Cr(VI) coating, Positive = Presence of Cr(VI) coating;

(The tested sample should be further verified by boiling-water-extraction method if the spot test result is Negative or cannot be confirmed.)

◇Boiling-water-extraction:

Negative = Absence of Cr(VI) coating

Positive = Presence of Cr(VI) coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm<sup>2</sup> sample surface area.

For corrosion protection coatings on metals: Information on storage conditions and production date of the tested sample is unavailable and thus results of Cr(VI) represent status of the sample at the time of testing.

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Date: 22 May 2012

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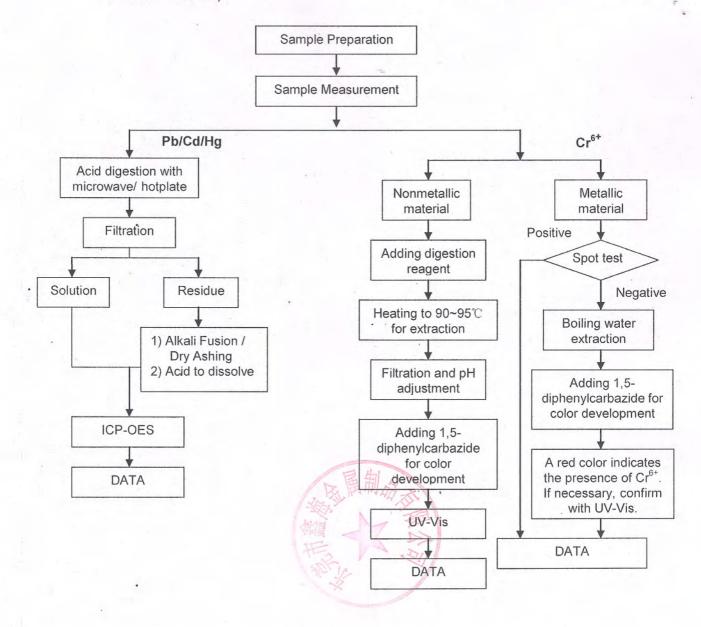
### **ATTACHMENTS**

# **RoHS Testing Flow Chart**

1) Name of the person who made testing: Jan Shi/Yoyo Wang/Allen Xiao

2) Name of the person in charge of testing: Jeff Zhang/George Xu

3) These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr<sup>6+</sup> test method excluded)



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DONGGUAN CITY XINHAI METAL PRODUCTS CO.,LTD

1ST WEIMING ROAD HENGZENG AV.XINAN COMMUNITY CHANGAN TOWN DONGGUAN CITY GUANGDONG PROVINCE

The following sample(s) was/were submitted and identified on behalf of the clients as : SILVER COLOR PLATING OF LEAD WIRE

SGS Job No.:

SP12-014327 - SH

Composition:

TIN

Date of Sample Received:

17 May 2012

Testing Period:

17 May 2012 - 22 May 2012

Test Requested:

Selected test(s) as requested by client.

Test Method:

Please refer to next page(s).

Test Results:

Please refer to next page(s).

Conclusion:

Based on the performed tests on selected part of submitted sample(s), the

results of Lead, Mercury, Cadmium, Hexavalent chromium comply with the limits

in RoHS Directive 2011/65/EU Annex II; recasting 2002/95/EC.

Signed for and on behalf of SGS-CSTC Ltd.

Fan Jingjie, JJ Approved Signatory

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No. SHAEC1207780403

Date: 22 May 2012

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Test Results:

Test Part Description:

Specimen No. SGS Sample ID Description

SHA12-077804.003

Silvery metal plating

Remarks:

(1) 1 mg/kg = 1 ppm = 0.0001%

(2) MDL = Method Detection Limit

(3) ND = Not Detected ( < MDL)

(4) "-" = Not Regulated

### RoHS Directive 2011/65/EU

Test Method: (1) IEC 62321:2008 application of modified digestion by surface etching for Cadmium, Lead and

Mercury, analysis by ICP-OES

(2) With reference to IEC 62321:2008 for Hexavalent Chromium by spot test / Colorimetric

Method.

Test Item(s)		Limit	Unit	MDL	003
Lead (Pb)		1000	mg/kg	10	126
Cadmium (Cd)	*	100	mg/kg	10	ND .
Mercury (Hg)		1000	mg/kg	10	ND /
Hexavalent Chromium (CrVI)		-	-	$\Diamond$	Negative

### Notes:

(1) The maximum permissible limit is quoted from directive 2011/65/EU, Annex II

(2) Spot-test:

Negative = Absence of CrVI coating, Positive = Presence of CrVI coating;

The tested sample should be further verified by boiling-water-extraction method if the spot test result is Negative or cannot be confirmed.

Boiling-water-extraction:

Negative = Absence of CrVI coating; Positive = Presence of CrVI coating

The detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm2 sample surface area.

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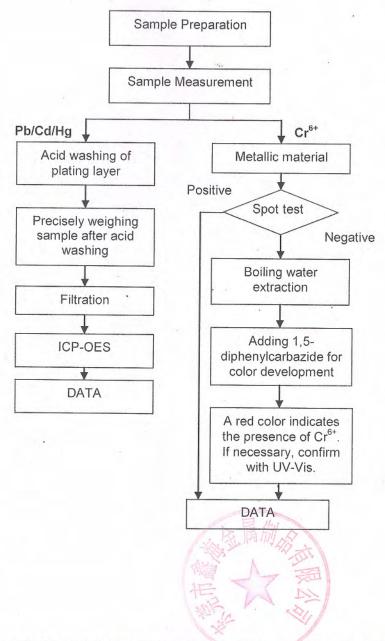
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## **ATTACHMENTS**

# Plating Pb/Cd/Hg/Cr6+ Testing Flow Chart

- 1) Name of the person who made testing: Vera Liu/Allen Xiao
- 2) Name of the person in charge of testing: Jeff Zhang/George Xu



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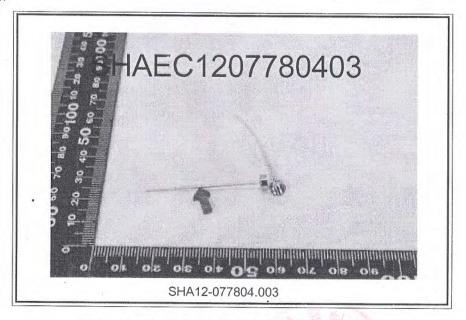


No. SHAEC1207780403

Date: 22 May 2012

Page 4 of 4

Sample photo:



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This so the way stated the results shown in this test report refer only to the sample(s) tested.

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# **TEST REPORT**

NO.: A002R121008024-2R02

Date: Oct.10, 2012

Page 1 of 4

Customer: SuZhou FuHong Electronic Industrial Co., Ltd.

Address: NO. 89 WEI DU ROAD, WANGTING TOWN, XIANGCHENG DISTRICT, SUZHOU, CHINA

Report on the submitted sample said to be

Sample name: Lead wire copper shell

Model: /

Item/Lot No.: /

Material: /

Buyer: /

Supplier: / Manufacturer: /

Comple resolved date.

Sample received date: Oct. 08, 2012

Testing period: From Oct. 08, 2012 to Oct. 10, 2012

#### **Testing Requested**

As specified by client, to determine the Lead, Cadmium, Mercury & Hexavalent Chromium content in the submitted sample in accordance with Directive 2002/95/EC (RoHS).

### Testing method:

Testing Item	Pretreatment method	Measuring instrument	MQL
Lead (Pb)	IEC 62321: 2008, section 9	ICP-OES	2mg/kg
Cadmium (Cd)	IEC 62321: 2008, section 9	ICP-OES	2 mg/kg
Mercury (Hg)	IEC 62321: 2008, section 7	ICP-OES	2 mg/kg
Chromium (Cr VI)	IEC 62321: 2008, Annex B	UV-VIS	0.02mg/kg*

### Note:

#### Conclusion:

-When tested as specified the submitted sample complied with the requirements of commission Decision of 18 Aug 2005 amending Directive 2002/95/EC notified under document 2005/618/EC.

\*\*\*\*\*\*FOR FURTHER DETAILS, PLEASE REFER TO THE FOLLOWING PAGE(S)\*\*\*\*\*\*

Signed for and on behalf of Shenzhen AOV Testing Technology Co., Ltd, Kunshan Branch

Project Leader:

Li Tingting, Maggie

**Chemical Test Director** 

Reviewed by: WEIKIN

Wang Wexin, Weikin

**Technical Director** 

Approved by:

Yuan Qi, Mickey

Lab Manager

<sup>-\* 0.02</sup> mg/kg refers to the MQL of sample extraction liquid.



out sample

# **TEST REPORT**

NO.: A002R121008024-2R02 Date: Oct.10, 2012 Page 2 of 4 Test Flow: 1. To Determine Lead, Cadmium Content: (Metal substrate) Tested by: onoul Weigh the sample into Add the digestion solution; the Add H2O2 until the sample is clear vessel is heated until the sample a vessel. has been dissolved Cooling the vessel, filter; washed and Tested by ICP-OES Report filled to the mark with distilled water. 2. To Determine Mercury Content: (Metal substrate) Tested by: The sample is digested in the Weigh the sample Add the digestion solution, close microwave oven following a specific into a vessel. the microwave vessel. decomposition program. Cooling the vessel, filter; washed and Tested by ICP-OES Report filled to the mark with distilled water. 3. To Determine Hexavalent Chromium Content (boiling- water- extraction): (Metal substrate) Tested by: Remove the sample, and cool Take the (50±5) cm2 Heat 50 mL of DI water in the beaker to room temperature, sample in the beaker. the beaker to boiling for 10 and do the color reaction Test the sample solution and the 0.02 Report mg/kg standard solution by UV-VIS. 4. To Determine Lead, Cadmium and Mercury Content: (Plating) Tested by: now Cooling, filter; washed and Weigh the plating-Tested by Report

filled to the mark with DI water.

Instrument



# TEST REPORT

NO.: A002R121008024-2R02

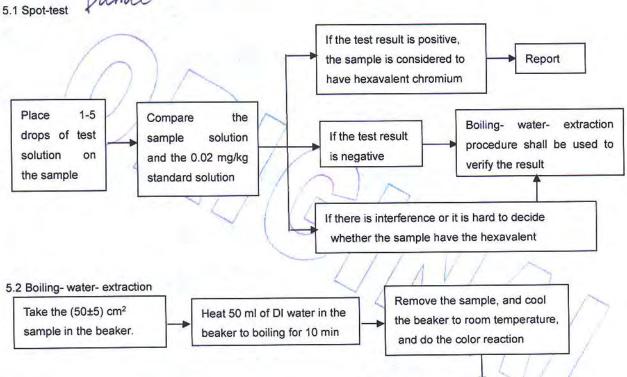
Date: Oct.10, 2012

Page 3 of 4

Test the sample solution and the 0.02

mg/kg standard solution by UV-VIS.

5. To Determine Hexavalent Chromium Content in colorless and colored chromate coating on metals: (Plating) Tested by:



Report

ample D	escription.		
Code	Sample Description	Code	Sample Description
2-1	Lead wire substrate	2-3	Copper shell substrate
2-2	Lead wire Plating	2-4	Copper shell Plating

#### st Results:

Item	Unit	RoHS Limit		Re	sult	
			2-1	2-2**	2-3	2-4**
Lead (Pb)	mg/kg	1000	N.D.	N.D.	N.D.	N.D.
Cadmium (Cd)	mg/kg	100	N.D.	N.D.	N.D.	N.D.
Mercury (Hg)	mg/kg	1000	N.D.	N.D.	N.D.	N.D.
Chromium (CrVI)	mg/kg	1000	Negative	Negative	Negative	Negative





# **TEST REPORT**

NO.: A002R121008024-2R02

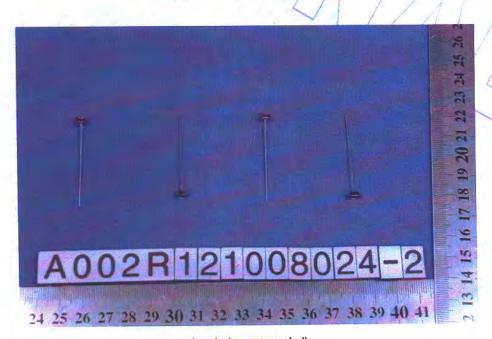
Date: Oct.10, 2012

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#### Note:

- -The new RoHS directive 2011/65/EU, on Jul. 21, 2011 come into force, on Jan. 03, 2013 the formal implementation, Directive 2002/95/EC shall be repealed simultaneously.
- -Specimens, which requested to determine Lead, Cadmium and Mercury Content, have been dissolved completely.
- -mg/kg=ppm
- -N.D.=not detected(<MQL)
- -MQL=Method Quantitation Limit
- -Negative=Absence of Cr (VI);
- -Positive=Presence of Cr (VI);
- Uncertain= can not verify whether the sample have Hexavalent Chromium by spot-test.
- ( The tested sample should be further verified by boiling-water-extraction method if the spot test result is uncertain or negative.)
- -\*\*The test is based on the following assumption: The sample plating is a single layer and each part is uniform. The test result maybe cannot stand for the physical truth of sample plating.
- -Photo is included

Photograph of Sample



Lead wire copper shell

\*\*\*End of Report\*\*\*





No. TSNEC1200272601

Date: 09 Apr 2012

Page 1 of 8

BEIJING HYSTIC NEW MATERIALS CO., LTD. 5 SHUANGYUAN ROAD, BADACHU HIGH-TECH ZONE, BEIJING. 100041, CHINA

The following sample(s) was/were submitted and identified on behalf of the clients as : EPOXY ADHESIVE

SGS Job No.:

TP12-004950 - TJ

Model No.:

**EP608** 

Date of Sample Received:

31 Mar 2012

Testing Period:

31 Mar 2012 - 09 Apr 2012

Test Requested:

Selected test(s) as requested by client.

Test Method:

Please refer to next page(s).

Test Results:

Please refer to next page(s).

Conclusion:

Based on the performed tests on submitted samples, the results of Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBB), Polybrominated diphenyl ethers (PBDE) comply with the limits as set by RoHS

Directive 2011/65/EU Annex II; recasting 2002/95/EC.

Signed for and on behalf of SGS-CSTC Ltd.

Aimy Wang

Approved Signatory

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No. TSNEC1200272601

Date: 09 Apr 2012

Page 2 of 8

Test Results:

#### Test Part Description:

Specimen No. SGS Sample ID Description TSN12-002726.001 1 ivory-white paste

Remarks:

(1) 1 mg/kg = 1 ppm = 0.0001%

(2) MDL = Method Detection Limit

(3) ND = Not Detected ( < MDL )

(4) "-" = Not Regulated

### RoHS Directive 2011/65/EU

Test Method: With reference to IEC 62321:2008

(1) Determination of Cadmium by ICP-OES.

(2) Determination of Lead by ICP-OES.

(3) Determination of Mercury by ICP-OES.

(4) Determination of Hexavalent Chromium by Colorimetric Method using UV-Vis.

(5) Determination of PBBs / PBDEs content by GC-MS.

Test Item(s)	<b>Limit</b>	<u>Unit</u>	MDL	001
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1000	mg/kg	2	ND
Mercury (Hg)	1000	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))	1000	mg/kg	2	ND
Sum of PBBs	1000	mg/kg	-	ND
Monobromobiphenyl	4	mg/kg	5	ND
Dibromobiphenyl	-	mg/kg	5	ND
Tribromobiphenyl	0-11	mg/kg	5	ND
Tetrabromobiphenyl	40	mg/kg	5	ND
Pentabromobiphenyl	<u> </u>	mg/kg	5	ND
Hexabromobiphenyl	-	mg/kg	5	ND
Heptabromobiphenyl		mg/kg	5	ND
Octabromobiphenyl		mg/kg	5	ND
Nonabromobiphenyl	1.0	mg/kg	5	ND
Decabromobiphenyl	. 4	mg/kg	5	ND
Sum of PBDEs	1000	mg/kg	,2	ND
Monobromodiphenyl ether	1.9	mg/kg	5	ND

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Test Report	No. TSNEC120027260	01	Date: 09	Apr 2012	Page 3 of 8
Test Item(s)	<u>Limit</u>	<u>Unit</u>	MDL	001	
Dibromodiphenyl ether		mg/kg	5	ND	
Tribromodiphenyl ether	-	mg/kg	5	ND	
Tetrabromodiphenyl ether	40	mg/kg	5	ND	
Pentabromodiphenyl ether	-	mg/kg	5	ND	
Hexabromodiphenyl ether	ė.	mg/kg	5	ND	
Heptabromodiphenyl ether	000	mg/kg	5	ND	
Octabromodiphenyl ether	-	mg/kg	5	ND	
Nonabromodiphenyl ether	18	mg/kg	5	ND	
Decabromodiphenyl ether	ů.	mg/kg	5	ND	

#### Notes:

# Hexabromocyclododecane (HBCDD)

Test Method: With reference to IEC 62321:2008, analysis was performed by GC-MS.

Test Item(s)	<u>Unit</u>	MDL	001
Hexabromocyclododecane (HBCDD)	mg/kg	10	ND

#### Notes:

(1) Reference Information: Directive 2011/65/EU recasting RoHS directive 2002/95/EC: Hexabromocyclododecane (HBCDD) is considered as a priority for risk evaluation and substance restriction.

### **Phthalates**

Test Method: With reference to EN14372: 2004, analysis was performed by GC-MS.

Test Item(s)	<u>Unit</u>	MDL	001
Dibutyl Phthalate (DBP)	% (w/w)	0.003	ND
Benzylbutyl Phthalate (BBP)	% (w/w)	0.003	ND
Bis-(2-ethylhexyl) Phthalate (DEHP)	% (w/w)	0.003	ND
Notes:			

(1) Reference Information: Directive 2011/65/EU recasting RoHS directive 2002/95/EC: Bis (2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP) and Dibutyl phthalate (DBP) are considered as a priority for risk evaluation and substance restriction.

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<sup>(1)</sup> The maximum permissible limit is quoted from directive 2011/65/EU, Annex II.



No. TSNEC1200272601

Date: 09 Apr 2012

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Result shown is of the total weight of wet sample

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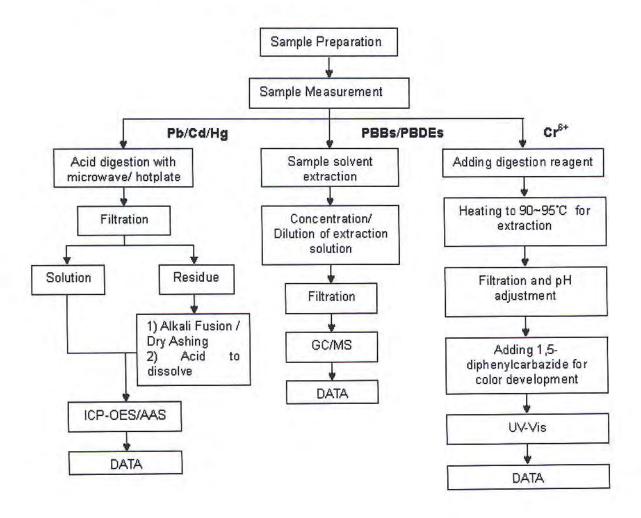
Date: 09 Apr 2012

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### **ATTACHMENTS**

# Cd/Pb/Hg/Cr<sup>S+</sup>/PBBs&PBDEs Flow Chart

- 1) Name of the person who made testing: Aaron Wang/Jason Li /Angell Yao
- 2) Name of the person in charge of testing: Cindy Yin/Rex Zhu
- 3) These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr8+ and PBBs/PBDEs test method excluded)



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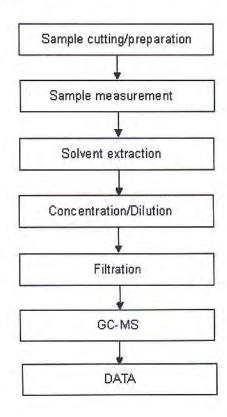
Date: 09 Apr 2012

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#### **ATTACHMENTS**

### **HBCDD Testing Flow Chart**

- 1) Name of the person who made testing: Marina Sun
- 2) Name of the person in charge of testing: Rex Zhu



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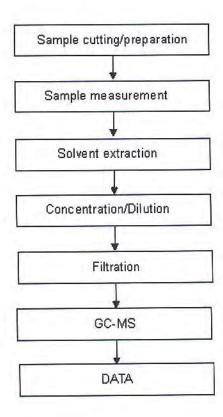
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### **ATTACHMENTS**

### Phthalate Testing Flow Chart

1) Name of the person who made testing: Marina Sun

2) Name of the person in charge of testing: Rex Zhu



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No. TSNEC1200272601

Date: 09 Apr 2012

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No. TSNEC1200272602

Date: 09 Apr 2012

Page 1 of 4

BEIJING HYSTIC NEW MATERIALS CO., LTD. 5 SHUANGYUAN ROAD, BADACHU HIGH-TECH ZONE, BEIJING. 100041, CHINA

The following sample(s) was/were submitted and identified on behalf of the clients as: EPOXY ADHESIVE

SGS Job No.:

TP12-004950 - TJ

Model No.:

**EP608** 

Date of Sample Received:

31 Mar 2012

Testing Period:

31 Mar 2012 - 09 Apr 2012

Test Requested:

Selected test(s) as requested by client.

Test Method:

Please refer to next page(s).

Test Results:

Please refer to next page(s).

Signed for and on behalf of SGS-CSTC Ltd.

Aimy Wang

Approved Signatory

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No. TSNEC1200272602

Date: 09 Apr 2012

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Test Results:

### Test Part Description:

Specimen No.

SGS Sample ID

Description

TSN12-002726.002

ivory-white paste

#### Remarks:

(1) 1 mg/kg = 1 ppm = 0.0001%

(2) MDL = Method Detection Limit

(3) ND = Not Detected ( < MDL )

(4) "-" = Not Regulated

### Halogen

Test Method: With reference to EN 14582: 2007, analysis was performed by Ion Chromatograph (IC).

<u>Unit</u>	MDL	002
mg/kg	50	57
mg/kg	50	7557
mg/kg	50	ND
mg/kg	50	ND
	mg/kg mg/kg mg/kg	mg/kg 50 mg/kg 50 mg/kg 50

Result shown is of the total weight of wet sample

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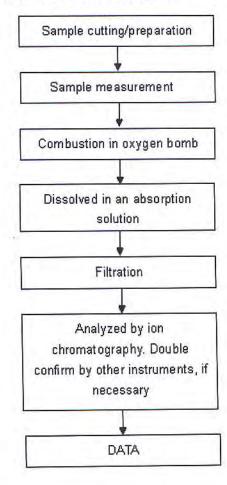
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### **ATTACHMENTS**

### Halogen Testing Flow Chart

- 1) Name of the person who made testing: Angell Yao
- 2) Name of the person in charge of testing: Rex Zhu



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Sample photo:



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SGS Mansion, No. 41, The 5th Avenue TEDA, Tianjin, China 300457 t (86-22) 65288000 1 (86-22) 25295252 中国·天津市经济技术开发区第五大街41号SGS大厦

邮编: 300457 1 (86-22) 65288000 1 (86-22) 25295252



Number: TWNC00282886 Test Report

Littelfuse Philippines Inc. Applicant:

Date : Oct 31, 2012

LIMA Technology Center, Lipa City,

Malvar, Batangas

Sample Description:

One (1) group of submitted samples said to be :

Part Description : sand : 091250 Part Number

: Oct 24, 2012 Date Sample Received Date Test Started : Oct 25, 2012

Test Conducted :

As requested by the applicant, for details please refer to attached pages.

Authorized By: On Behalf Of Intertek Testing Services Taiwan Limited



K. Y. Liang Director





Number: TWNC00282886

Test Conducted

( I ) Test Result Summary :

Heavy Metal  Cadmium (Cd) content ND Lead (Pb) content ND Chromium VI (Cr*) content ND Chromium VI (Cr*) content ND Dibrominated Biphenyls (PBBs) Monobrominated Biphenyls (MonoBB) ND Tribrominated Biphenyls (TriBB) ND Tetrabrominated Biphenyls (TriBB) ND Tetrabrominated Biphenyls (PentaBB) ND Hexabrominated Biphenyls (HexaBB) ND Hexabrominated Biphenyls (HexaBB) ND Heptabrominated Biphenyls (HexaBB) ND Hootabrominated Biphenyls (NonaBB) ND Octabrominated Biphenyls (NonaBB) ND Decabrominated Biphenyls (NonaBB) ND Nonabrominated Biphenyls (NonaBB) ND Docabrominated Biphenyl (DecaBB) ND Docabrominated Diphenyl Ethers (MonoBDE) ND Tribrominated Diphenyl Ethers (TriBDE) ND Tetrabrominated Diphenyl Ethers (TriBDE) ND Tetrabrominated Diphenyl Ethers (TetraBDE) ND Tetrabrominated Diphenyl Ethers (TetraBDE) ND Hexabrominated Diphenyl Ethers (HexaBDE) ND Nonabrominated Diphenyl Ethers (NonaBDE) ND	) Test Result Summary :	
Heavy Metal  Cadmium (Cd) content ND  Lead (Pb) content ND  Mercury (Hg) content ND  Polybrominated Biphenyls (PBBs)  Monobrominated Biphenyls (MonoBB) ND  Dibrominated Biphenyls (TriBB) ND  Tribrominated Biphenyls (TetraBB) ND  Tetrabrominated Biphenyls (PentaBB) ND  Hexabrominated Biphenyls (HexaBB) ND  Hexabrominated Biphenyls (HexaBB) ND  Octabrominated Biphenyls (HexaBB) ND  Octabrominated Biphenyls (OctaBB) ND  Openabrominated Biphenyls (NonaBB) ND  Pentabrominated Biphenyls (NonaBB) ND  Tribrominated Biphenyls (NonaBB) ND  Tribrominated Biphenyls (NonaBB) ND  Tribrominated Diphenyl Ethers (MonoBDE) ND  Polybrominated Diphenyl Ethers (MonoBDE) ND  Tribrominated Diphenyl Ethers (TriBDE) ND  Tribrominated Diphenyl Ethers (TetraBDE) ND  Tetrabrominated Diphenyl Ethers (TetraBDE) ND  Hexabrominated Diphenyl Ethers (HexaBDE) ND  Hexabrominated Diphenyl Ethers (NonaBDE) ND  Hexabrominated Diphenyl Ethers (NonaBDE) ND  Nonabrominated Diphenyl Ethers (No	Togt Itom	Result (ppm)
Cadmium (Cd) content Lead (Pb) content Mercury (Hg) content Mercury (Hg) content Chromium VI (Cr <sup>5+</sup> ) content Polybrominated Biphenyls (PBBs) Monobrominated Biphenyls (MonoBB) Dibrominated Biphenyls (DiBB) Tribrominated Biphenyls (TriBB) ND Tribrominated Biphenyls (TriBB) ND Tetrabrominated Biphenyls (TetraBB) ND Hexabrominated Biphenyls (HexaBB) ND Hexabrominated Biphenyls (HexaBB) ND Heptabrominated Biphenyls (HexaBB) ND Hootabrominated Biphenyls (OctaBB) ND Octabrominated Biphenyls (OctaBB) ND Nonabrominated Biphenyls (NonaBB) ND Decabrominated Biphenyl (DecaBB) ND Polybrominated Diphenyl Ethers (PBDEs) Monobrominated Diphenyl Ethers (MonoBDE) Tribrominated Diphenyl Ethers (TriBDE) ND Tribrominated Diphenyl Ethers (TetraBDE) ND Tetrabrominated Diphenyl Ethers (PentaBDE) ND Hexabrominated Diphenyl Ethers (HexaBDE) ND Hexabrominated Diphenyl Ethers (PentaBDE) ND Hexabrominated Diphenyl Ethers (HexaBDE) ND Hexabrominated Diphenyl Ethers (NonaBDE) ND Nonabrominated Diphenyl Ethers (NonaBDE) ND	<u>lest item</u>	Submitted Samples
Lead (Pb) content  Mercury (Hg) content  Chromium VI (Cr <sup>9+</sup> ) content  Polybrominated Biphenyls (PBBs)  Monobrominated Biphenyls (MonoBB)  Dibrominated Biphenyls (DiBB)  Tribrominated Biphenyls (TriBB)  Tetrabrominated Biphenyls (TetraBB)  Pentabrominated Biphenyls (TetraBB)  ND  Pentabrominated Biphenyls (PentaBB)  Hexabrominated Biphenyls (HexaBB)  ND  Hexabrominated Biphenyls (HexaBB)  ND  Nonabrominated Biphenyls (NonaBB)  ND  Nonabrominated Biphenyls (NonaBB)  Decabrominated Biphenyl (DecaBB)  ND  Polybrominated Diphenyl Ethers (MonoBDE)  Dibrominated Diphenyl Ethers (MonoBDE)  Tribrominated Diphenyl Ethers (TriBDE)  Tribrominated Diphenyl Ethers (TriBDE)  ND  Tetrabrominated Diphenyl Ethers (TetraBDE)  ND  Hexabrominated Diphenyl Ethers (HexaBDE)  Hexabrominated Diphenyl Ethers (HexaBDE)  ND  Hexabrominated Diphenyl Ethers (HexaBDE)  ND  Doctabrominated Diphenyl Ethers (HexaBDE)  ND  Hexabrominated Diphenyl Ethers (HexaBDE)  ND  Doctabrominated Diphenyl Ethers (HexaBDE)  ND  Hexabrominated Diphenyl Ethers (HexaBDE)  ND  Doctabrominated Diphenyl Ethers (NonaBDE)  ND  Nonabrominated Diphenyl Ethers (NonaBDE)  Doctabrominated Diphenyl Ethers (NonaBDE)  ND  Nonabrominated Diphenyl Ethers (NonaBDE)  ND  Decabrominated Diphenyl Ethers (NonaBDE)  ND  Nonabrominated Diphenyl Ethers (NonaBDE)  ND  Decabrominated Diphenyl Ethers (NonaBDE)  ND  Nonabrominated Diphenyl Ethers (NonaBDE)  ND  Nonabrominated Diphenyl Ethers (NonaBDE)  ND  Decabrominated Diphenyl Ethers (NonaBDE)  ND  ND  Nonabrominated Diphenyl Ethers (NonaBDE)  ND  Decabrominated Diphenyl Ethers (NonaBDE)  ND  Decabrominated Diphenyl Ethers (NonaBDE)  ND  ND  ND  ND  Bromine (Br)	Heavy Metal	
Mercury (Hg) content Chromium VI (Cr*) content  Polybrominated Biphenyls (PBBs)  Monobrominated Biphenyls (MonoBB)  Dibrominated Biphenyls (DiBB)  Tribrominated Biphenyls (TriBB)  Tribrominated Biphenyls (TriBB)  Tetrabrominated Biphenyls (TetraBB)  ND  Pentabrominated Biphenyls (PentaBB)  ND  Hexabrominated Biphenyls (HexaBB)  ND  Heptabrominated Biphenyls (HexaBB)  ND  Octabrominated Biphenyls (NonaBB)  ND  Nonabrominated Biphenyls (NonaBB)  ND  Nonabrominated Biphenyl (DecaBB)  ND  Polybrominated Diphenyl Ethers (PBDEs)  Monobrominated Diphenyl Ethers (MonoBDE)  Dibrominated Diphenyl Ethers (TriBDE)  Tribrominated Diphenyl Ethers (TriBDE)  ND  Tetrabrominated Diphenyl Ethers (TetraBDE)  Pentabrominated Diphenyl Ethers (PentaBDE)  ND  Hexabrominated Diphenyl Ethers (HexaBDE)  ND  Hexabrominated Diphenyl Ethers (HexaBDE)  ND  Heptabrominated Diphenyl Ethers (HexaBDE)  ND  ND  ND  Octabrominated Diphenyl Ethers (HexaBDE)  ND  ND  ND  ND  Docabrominated Diphenyl Ethers (NonaBDE)  ND  ND  Nonabrominated Diphenyl Ethers (NonaBDE)  ND  ND  Nonabrominated Diphenyl Ethers (NonaBDE)  ND  ND  Nonabrominated Diphenyl Ethers (NonaBDE)  ND  ND  Nonabrominated Diphenyl Ethers (NonaBDE)  ND  ND  ND  ND  ND  ND  ND  ND  ND  N	Cadmium (Cd) content	ND
Chromium VI (Cr*) content  Polybrominated Biphenyls (PBBs)  Monobrominated Biphenyls (MonoBB) Dibrominated Biphenyls (DiBB) Tribrominated Biphenyls (TriBB) Tribrominated Biphenyls (TriBB) ND Tetrabrominated Biphenyls (TetraBB) Pentabrominated Biphenyls (PentaBB) ND Hexabrominated Biphenyls (HexaBB) Hexabrominated Biphenyls (HexaBB) ND Octabrominated Biphenyls (MonaBB) ND Octabrominated Biphenyls (NonaBB) ND Decabrominated Biphenyl (DecaBB) ND Polybrominated Biphenyl (DecaBB) ND Polybrominated Diphenyl Ethers (PBDEs)  Monobrominated Diphenyl Ethers (MonoBDE) Dibrominated Diphenyl Ethers (TriBDE) Tribrominated Diphenyl Ethers (TetraBDE) ND Tetrabrominated Diphenyl Ethers (TetraBDE) ND Pentabrominated Diphenyl Ethers (HexaBDE) ND Hexabrominated Diphenyl Ethers (HexaBDE) ND Hexabrominated Diphenyl Ethers (HexaBDE) ND Heptabrominated Diphenyl Ethers (HexaBDE) ND Nonabrominated Diphenyl Ethers (NonaBDE) ND	Lead (Pb) content	ND
Polybrominated Biphenyls (PBBs)   ND		ND
Monobrominated Biphenyls (MonoBB) Dibrominated Biphenyls (DiBB) Tribrominated Biphenyls (TriBB) Tetrabrominated Biphenyls (TetraBB) Pentabrominated Biphenyls (PentaBB) ND Pentabrominated Biphenyls (PentaBB) Hexabrominated Biphenyls (HexaBB) Heptabrominated Biphenyls (HeyaBB) ND Octabrominated Biphenyls (OctaBB) ND Nonabrominated Biphenyls (NonaBB) Decabrominated Biphenyls (NonaBB) ND Polybrominated Biphenyl (DecaBB) Monobrominated Diphenyl Ethers (PBDES) Monobrominated Diphenyl Ethers (MonoBDE) Dibrominated Diphenyl Ethers (TriBDE) ND Tribrominated Diphenyl Ethers (TriBDE) ND Tetrabrominated Diphenyl Ethers (TetraBDE) Pentabrominated Diphenyl Ethers (PentaBDE) ND Hexabrominated Diphenyl Ethers (HexaBDE) Hexabrominated Diphenyl Ethers (HexaBDE) ND Heptabrominated Diphenyl Ethers (OctaBDE) ND Nonabrominated Diphenyl Ethers (NonaBDE) ND Decabrominated Diphenyl Ethers (NonaBDE) ND Nonabrominated Diphenyl Ethers (NonaBDE) ND Decabrominated Diphenyl Ethers (NonaBDE) ND Nonabrominated Diphenyl Ethers (NonaBDE) ND Nonabrominated Diphenyl Ethers (NonaBDE) ND Decabrominated Diphenyl Ethers (NonaBDE) ND ND Nonabrominated Diphenyl Ethers (NonaBDE) ND	Chromium VI (Cr <sup>6+</sup> ) content	ND
Dibrominated Biphenyls (DiBB) Tribrominated Biphenyls (TriBB) Tetrabrominated Biphenyls (TetraBB) ND Tetrabrominated Biphenyls (PentaBB) Pentabrominated Biphenyls (PentaBB) ND Hexabrominated Biphenyls (HexaBB) ND Heptabrominated Biphenyls (HeptaBB) ND Octabrominated Biphenyls (OctaBB) ND Nonabrominated Biphenyls (NonaBB) Decabrominated Biphenyl (DecaBB) ND Polybrominated Biphenyl (DecaBB) ND Polybrominated Diphenyl Ethers (PBDES) Monobrominated Diphenyl Ethers (MonoBDE) Dibrominated Diphenyl Ethers (TriBDE) Tribrominated Diphenyl Ethers (TriBDE) ND Tetrabrominated Diphenyl Ethers (TetraBDE) Pentabrominated Diphenyl Ethers (PentaBDE) ND Hexabrominated Diphenyl Ethers (HexaBDE) ND Heptabrominated Diphenyl Ethers (HeptaBDE) ND Octabrominated Diphenyl Ethers (OctaBDE) ND Nonabrominated Diphenyl Ethers (NonaBDE) Decabrominated Diphenyl Ether (DecaBDE) ND Halogen Content Fluorine (F) Chlorine (C1) ND Bromine (Br)	Polybrominated Biphenyls (PBBs)	
Tribrominated Biphenyls (TriBB)  Tetrabrominated Biphenyls (TetraBB)  Pentabrominated Biphenyls (PentaBB)  Hexabrominated Biphenyls (HexaBB)  Heptabrominated Biphenyls (HexaBB)  ND  Octabrominated Biphenyls (OctaBB)  ND  Nonabrominated Biphenyls (NonaBB)  ND  Decabrominated Biphenyls (NonaBB)  Decabrominated Biphenyl (DecaBB)  Polybrominated Diphenyl Ethers (PBDES)  Monobrominated Diphenyl Ethers (MonoBDE)  Dibrominated Diphenyl Ethers (TriBDE)  Tribrominated Diphenyl Ethers (TriBDE)  Tetrabrominated Diphenyl Ethers (TetraBDE)  Pentabrominated Diphenyl Ethers (FentaBDE)  Hexabrominated Diphenyl Ethers (HexaBDE)  Hexabrominated Diphenyl Ethers (HexaBDE)  ND  Hexabrominated Diphenyl Ethers (HonaBDE)  ND  Octabrominated Diphenyl Ethers (OctaBDE)  ND  ND  ND  Decabrominated Diphenyl Ethers (NonaBDE)  Decabrominated Diphenyl Ether (DecaBDE)  ND  Decabrominated Diphenyl Ether (DecaBDE)	Monobrominated Biphenyls (MonoBB)	ND
Tetrabrominated Biphenyls (TetraBB) Pentabrominated Biphenyls (PentaBB) ND Hexabrominated Biphenyls (HexaBB) ND Heptabrominated Biphenyls (HexaBB) ND Octabrominated Biphenyls (OctaBB) ND Nonabrominated Biphenyls (NonaBB) Decabrominated Biphenyls (NonaBB) Decabrominated Biphenyl (DecaBB) ND Polybrominated Diphenyl Ethers (PBDES) Monobrominated Diphenyl Ethers (MonoBDE) Dibrominated Diphenyl Ethers (TriBDE) Tribrominated Diphenyl Ethers (TriBDE) ND Tetrabrominated Diphenyl Ethers (TetraBDE) ND Pentabrominated Diphenyl Ethers (PentaBDE) ND Hexabrominated Diphenyl Ethers (HexaBDE) ND Heptabrominated Diphenyl Ethers (HeptaBDE) ND Octabrominated Diphenyl Ethers (OctaBDE) ND Nonabrominated Diphenyl Ethers (NonaBDE) Decabrominated Diphenyl Ethers (NonaBDE) ND Decabrominated Diphenyl Ether (DecaBDE) ND Decabrominated Diphenyl Ether (NonaBDE) ND Decabrominated Diphenyl Ether (NonaBDE) ND Decabrominated Diphenyl Ether (DecaBDE) ND Decabrominated Diphenyl Ether (DecaBD	Dibrominated Biphenyls (DiBB)	ND
Pentabrominated Biphenyls (PentaBB)  Hexabrominated Biphenyls (HexaBB)  ND  Heptabrominated Biphenyls (HeptaBB)  Octabrominated Biphenyls (OctaBB)  ND  Nonabrominated Biphenyls (NonaBB)  Decabrominated Biphenyls (NonaBB)  Decabrominated Biphenyl (DecaBB)  ND  Polybrominated Diphenyl Ethers (PBDES)  Monobrominated Diphenyl Ethers (MonoBDE)  Dibrominated Diphenyl Ethers (DiBDE)  Tribrominated Diphenyl Ethers (TriBDE)  Tetrabrominated Diphenyl Ethers (TetraBDE)  Pentabrominated Diphenyl Ethers (PentaBDE)  Hexabrominated Diphenyl Ethers (HexaBDE)  Heptabrominated Diphenyl Ethers (HexaBDE)  ND  Octabrominated Diphenyl Ethers (OctaBDE)  ND  Nonabrominated Diphenyl Ethers (NonaBDE)  ND  Nonabrominated Diphenyl Ethers (NonaBDE)  ND  ND  Halogen Content  Fluorine (F)  ND  Chlorine (C1)  Bromine (Br)	Tribrominated Biphenyls (TriBB)	ND
Hexabrominated Biphenyls (HexaBB)  Heptabrominated Biphenyls (HeptaBB)  Octabrominated Biphenyls (OctaBB)  ND  Nonabrominated Biphenyls (NonaBB)  Decabrominated Biphenyl (DecaBB)  ND  Polybrominated Diphenyl Ethers (PBDES)  Monobrominated Diphenyl Ethers (MonoBDE)  Dibrominated Diphenyl Ethers (DiBDE)  Tribrominated Diphenyl Ethers (TriBDE)  Tetrabrominated Diphenyl Ethers (TetraBDE)  Pentabrominated Diphenyl Ethers (PentaBDE)  Hexabrominated Diphenyl Ethers (HexaBDE)  Hexabrominated Diphenyl Ethers (HexaBDE)  ND  Octabrominated Diphenyl Ethers (OctaBDE)  ND  Nonabrominated Diphenyl Ethers (NonaBDE)  ND  Decabrominated Diphenyl Ether (DecaBDE)  ND  Halogen Content  Fluorine (F)  Chlorine (C1)  Bromine (Br)	Tetrabrominated Biphenyls (TetraBB)	ND
Heptabrominated Biphenyls (HeptaBB)  Octabrominated Biphenyls (OctaBB)  ND  Nonabrominated Biphenyls (NonaBB)  Decabrominated Biphenyl (DecaBB)  Polybrominated Diphenyl Ethers (PBDES)  Monobrominated Diphenyl Ethers (MonoBDE)  Dibrominated Diphenyl Ethers (DiBDE)  Tribrominated Diphenyl Ethers (TriBDE)  Tetrabrominated Diphenyl Ethers (TetraBDE)  Pentabrominated Diphenyl Ethers (PentaBDE)  ND  Pentabrominated Diphenyl Ethers (PentaBDE)  Hexabrominated Diphenyl Ethers (HexaBDE)  ND  Heptabrominated Diphenyl Ethers (HeptaBDE)  ND  Octabrominated Diphenyl Ethers (OctaBDE)  ND  Nonabrominated Diphenyl Ethers (NonaBDE)  ND  Decabrominated Diphenyl Ethers (NonaBDE)  ND  Halogen Content  Fluorine (F)  Chlorine (C1)  Bromine (Br)	Pentabrominated Biphenyls (PentaBB)	ND
Octabrominated Biphenyls (OctaBB)  Nonabrominated Biphenyls (NonaBB)  Decabrominated Biphenyl (DecaBB)  ND  Polybrominated Diphenyl Ethers (PBDES)  Monobrominated Diphenyl Ethers (MonoBDE)  Dibrominated Diphenyl Ethers (DiBDE)  Tribrominated Diphenyl Ethers (TriBDE)  Tetrabrominated Diphenyl Ethers (TetraBDE)  Pentabrominated Diphenyl Ethers (PentaBDE)  Hexabrominated Diphenyl Ethers (HexaBDE)  Hexabrominated Diphenyl Ethers (HexaBDE)  ND  Heptabrominated Diphenyl Ethers (HeptaBDE)  ND  Octabrominated Diphenyl Ethers (OctaBDE)  Nonabrominated Diphenyl Ethers (NonaBDE)  ND  Nonabrominated Diphenyl Ethers (NonaBDE)  ND  Halogen Content  Fluorine (F)  Chlorine (Cl)  Bromine (Br)	Hexabrominated Biphenyls (HexaBB)	ND
Nonabrominated Biphenyls (NonaBB) Decabrominated Biphenyl (DecaBB) ND  Polybrominated Diphenyl Ethers (PBDEs)  Monobrominated Diphenyl Ethers (MonoBDE) Dibrominated Diphenyl Ethers (DiBDE) Tribrominated Diphenyl Ethers (TriBDE) ND  Tetrabrominated Diphenyl Ethers (TetraBDE) Pentabrominated Diphenyl Ethers (PentaBDE) Hexabrominated Diphenyl Ethers (HexaBDE) Heptabrominated Diphenyl Ethers (HeptaBDE) ND  Octabrominated Diphenyl Ethers (OctaBDE) ND  Nonabrominated Diphenyl Ethers (NonaBDE) Decabrominated Diphenyl Ethers (NonaBDE) ND  Halogen Content  Fluorine (F) Chlorine (C1) Bromine (Br) ND	Heptabrominated Biphenyls (HeptaBB)	ND
Decabrominated Biphenyl (DecaBB)  Polybrominated Diphenyl Ethers (PBDEs)  Monobrominated Diphenyl Ethers (MonoBDE)  Dibrominated Diphenyl Ethers (DiBDE)  Tribrominated Diphenyl Ethers (TriBDE)  Tetrabrominated Diphenyl Ethers (TetraBDE)  Pentabrominated Diphenyl Ethers (PentaBDE)  Hexabrominated Diphenyl Ethers (HexaBDE)  Heptabrominated Diphenyl Ethers (HexaBDE)  ND  Octabrominated Diphenyl Ethers (HeptaBDE)  NO  Nonabrominated Diphenyl Ethers (OctaBDE)  Nonabrominated Diphenyl Ethers (NonaBDE)  Decabrominated Diphenyl Ether (DecaBDE)  ND  Halogen Content  Fluorine (F)  Chlorine (C1)  Bromine (Br)	Octabrominated Biphenyls (OctaBB)	ND
Monobrominated Diphenyl Ethers (MonoBDE)  Dibrominated Diphenyl Ethers (DiBDE)  Tribrominated Diphenyl Ethers (TriBDE)  Tetrabrominated Diphenyl Ethers (TetraBDE)  Pentabrominated Diphenyl Ethers (PentaBDE)  Hexabrominated Diphenyl Ethers (HexaBDE)  Heytabrominated Diphenyl Ethers (HexaBDE)  ND  Octabrominated Diphenyl Ethers (HeptaBDE)  ND  Nonabrominated Diphenyl Ethers (OctaBDE)  ND  Nonabrominated Diphenyl Ethers (NonaBDE)  Decabrominated Diphenyl Ether (DecaBDE)  ND  Halogen Content  Fluorine (F)  Chlorine (C1)  Bromine (Br)		ND
Monobrominated Diphenyl Ethers (MonoBDE)  Dibrominated Diphenyl Ethers (DiBDE)  Tribrominated Diphenyl Ethers (TriBDE)  Tetrabrominated Diphenyl Ethers (TetraBDE)  Pentabrominated Diphenyl Ethers (PentaBDE)  Hexabrominated Diphenyl Ethers (HexaBDE)  Heptabrominated Diphenyl Ethers (HeptaBDE)  Octabrominated Diphenyl Ethers (OctaBDE)  Nonabrominated Diphenyl Ethers (NonaBDE)  Nonabrominated Diphenyl Ethers (NonaBDE)  Noberabrominated Diphenyl Ether (DecaBDE)  Noberabrominated Diphenyl Ether (DecaBDE)  Halogen Content  Fluorine (F)  Chlorine (Cl)  Bromine (Br)		ND
Dibrominated Diphenyl Ethers (DiBDE)  Tribrominated Diphenyl Ethers (TriBDE)  Tetrabrominated Diphenyl Ethers (TetraBDE)  Pentabrominated Diphenyl Ethers (PentaBDE)  Hexabrominated Diphenyl Ethers (HexaBDE)  Heptabrominated Diphenyl Ethers (HeptaBDE)  Octabrominated Diphenyl Ethers (OctaBDE)  ND  Nonabrominated Diphenyl Ethers (NonaBDE)  ND  Decabrominated Diphenyl Ethers (NonaBDE)  Decabrominated Diphenyl Ether (DecaBDE)  Halogen Content  Fluorine (F)  Chlorine (Cl)  Bromine (Br)	Polybrominated Diphenyl Ethers (PBDEs)	
Tribrominated Diphenyl Ethers (TriBDE)  Tetrabrominated Diphenyl Ethers (TetraBDE)  Pentabrominated Diphenyl Ethers (PentaBDE)  Hexabrominated Diphenyl Ethers (HexaBDE)  Heptabrominated Diphenyl Ethers (HeptaBDE)  Octabrominated Diphenyl Ethers (OctaBDE)  Nonabrominated Diphenyl Ethers (NonaBDE)  Nonabrominated Diphenyl Ethers (NonaBDE)  Decabrominated Diphenyl Ether (DecaBDE)  ND  Halogen Content  Fluorine (F)  Chlorine (Cl)  Bromine (Br)		ND
Tetrabrominated Diphenyl Ethers (TetraBDE) Pentabrominated Diphenyl Ethers (PentaBDE) ND Hexabrominated Diphenyl Ethers (HexaBDE) ND Heptabrominated Diphenyl Ethers (HeptaBDE) Octabrominated Diphenyl Ethers (OctaBDE) Nonabrominated Diphenyl Ethers (NonaBDE) ND Decabrominated Diphenyl Ethers (NonaBDE) Decabrominated Diphenyl Ether (DecaBDE) ND Halogen Content Fluorine (F) Chlorine (Cl) Bromine (Br) ND	Dibrominated Diphenyl Ethers (DiBDE)	ND
Pentabrominated Diphenyl Ethers (PentaBDE)  Hexabrominated Diphenyl Ethers (HexaBDE)  ND  Heptabrominated Diphenyl Ethers (HeptaBDE)  Octabrominated Diphenyl Ethers (OctaBDE)  Nonabrominated Diphenyl Ethers (NonaBDE)  Decabrominated Diphenyl Ether (DecaBDE)  ND  Halogen Content  Fluorine (F)  Chlorine (Cl)  Bromine (Br)	Tribrominated Diphenyl Ethers (TriBDE)	ND
Hexabrominated Diphenyl Ethers (HexaBDE)  Heptabrominated Diphenyl Ethers (HeptaBDE)  Octabrominated Diphenyl Ethers (OctaBDE)  Nonabrominated Diphenyl Ethers (NonaBDE)  Decabrominated Diphenyl Ether (DecaBDE)  ND  Halogen Content  Fluorine (F)  Chlorine (Cl)  Bromine (Br)		ND
Heptabrominated Diphenyl Ethers (HeptaBDE)  Octabrominated Diphenyl Ethers (OctaBDE)  Nonabrominated Diphenyl Ethers (NonaBDE)  Decabrominated Diphenyl Ether (DecaBDE)  ND  Halogen Content  Fluorine (F)  Chlorine (Cl)  Bromine (Br)	Pentabrominated Diphenyl Ethers (PentaBDE)	ND
Octabrominated Diphenyl Ethers (OctaBDE) Nonabrominated Diphenyl Ethers (NonaBDE) Decabrominated Diphenyl Ether (DecaBDE) ND Halogen Content Fluorine (F) Chlorine (Cl) Bromine (Br) ND	Hexabrominated Diphenyl Ethers (HexaBDE)	ND
Nonabrominated Diphenyl Ethers (NonaBDE)  Decabrominated Diphenyl Ether (DecaBDE)  ND  Halogen Content  Fluorine (F)  Chlorine (Cl)  Bromine (Br)  ND  ND  ND  ND		ND
Decabrominated Diphenyl Ether (DecaBDE)  Halogen Content  Fluorine (F)  Chlorine (Cl)  Bromine (Br)  ND  ND		ND
Halogen Content           Fluorine (F)         ND           Chlorine (Cl)         ND           Bromine (Br)         ND		ND
Fluorine (F) ND Chlorine (Cl) ND Bromine (Br) ND	Decabrominated Diphenyl Ether (DecaBDE)	ND
Chlorine (Cl) ND Bromine (Br) ND	Halogen Content	
Bromine (Br) ND	, ,	ND
, ,		ND
Iodine (I) ND	· · ·	ND
	Iodine (I)	ND

Remarks: ppm = Parts per million based on weight of tested sample = mg/kg

ND = Not detected

Responsibility of Chemist : Irene Chiou / Kevin Liu / Cathy Chen

Date Sample Received : Oct 24, 2012

Test Period : Oct 25, 2012 To Oct 30, 2012





Number: TWNC00282886

### Test Conducted

### ( $\Pi$ ) RoHS Limits:

Restricted Substances	Limits
Cadmium (Cd) Content	0.01% (100ppm)
Lead (Pb) Content	0.1% (1000ppm)
Mercury (Hg) Content	0.1% (1000ppm)
Chromium VI (Cr <sup>6+</sup> ) Content	0.1% (1000ppm)
Polybrominated Biphenyls (PBBs)	0.1% (1000ppm)
Polybrominated Diphenyl Ehters (PBDEs)	0.1% (1000ppm)

The above limits were quoted from Annex II of 2011/65/EU for homogeneous material.

### (Ⅲ) Test Method:

Test Item	Test Method	Reporting Limit
Cadmium (Cd) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Lead (Pb) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Mercury (Hg) content	With reference to IEC 62321 edition 1.0:2008 in clause 7, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Chromium VI (Cr <sup>6+</sup> ) content	With reference to IEC 62321 edition 1.0:2008 in annex C, by alkaline digestion and determined by UV-Vis spectrophotometer.	1 ppm





Number : TWNC00282886

# Test Conducted

## (Ⅲ) Test Method:

Test Item	Test Method	Reporting Limit
Polybrominated Biphenyls (PBBs)	With reference to IEC 62321 edition 1.0:2008 in annex A, by solvent extraction and determined by GC-MS and further HPLC-DAD confirmation when necessary.	5 ppm
Polybrominated Diphenyl Ethers (PBDEs)	With reference to IEC 62321 edition 1.0:2008 in annex A, by solvent extraction and determined by GC-MS and further HPLC-DAD confirmation when necessary.	5 ppm
Halogen Content	With reference to EN 14582:2007 by calorimetric bomb with oxygen and determined by Ion Chromatograph.	50 ppm

Remark: Reporting limit = Quantitation limit of analyte in sample



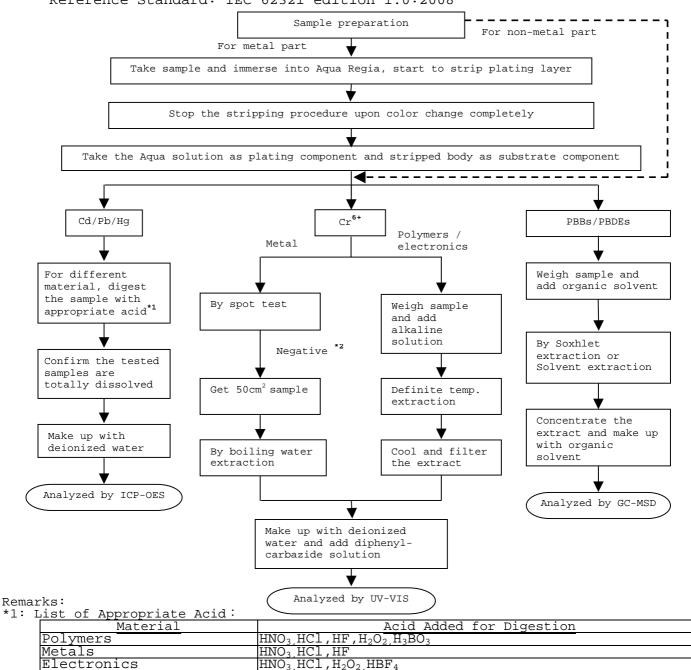


Number : TWNC00282886

#### Test Conducted

(N) Measurement Flowchart:

Test for Cd/Pb/Hg/Chromium (VI)/PBBS/PBDES Contents Reference Standard: IEC 62321 edition 1.0:2008



\*2: If the result of spot test is positive, Chromium VI would be determined as detected.



## Intertek Testing Services Taiwan Ltd.

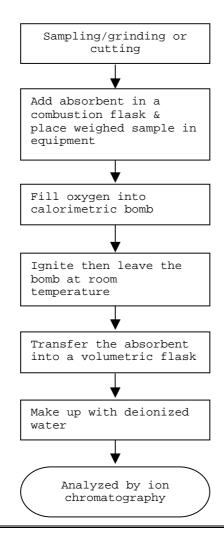


Number: TWNC00282886

Test Conducted

(N) Measurement Flowchart:

Test for Halogen Content Reference Standard: EN 14582



End of Report

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Test Conducted

Number: TWNC00282886

### Photo









Number: TWNC00282887 Test Report

Littelfuse Philippines Inc. Applicant:

Date : Oct 31, 2012

LIMA Technology Center, Lipa City,

Malvar, Batangas

Sample Description:

One (1) group of submitted samples said to be :

Part Description : Filler : 091251 Part Number

: Oct 24, 2012 Date Sample Received Date Test Started : Oct 25, 2012

Test Conducted :

As requested by the applicant, for details please refer to attached pages.

Authorized By: On Behalf Of Intertek Testing Services Taiwan Limited



K. Y. Liang Director





Number: TWNC00282887

Test Conducted

( I ) Test Result Summary :

) Test Result Summary :	
Togt Itom	Result (ppm)
<u>Test Item</u>	Submitted Samples
Heavy Metal	
Cadmium (Cd) content	ND
Lead (Pb) content	ND
Mercury (Hg) content	ND
Chromium VI (Cr <sup>6+</sup> ) content	ND
Polybrominated Biphenyls (PBBs)	
Monobrominated Biphenyls (MonoBB)	ND
Dibrominated Biphenyls (DiBB)	ND
Tribrominated Biphenyls (TriBB)	ND
Tetrabrominated Biphenyls (TetraBB)	ND
Pentabrominated Biphenyls (PentaBB)	ND
Hexabrominated Biphenyls (HexaBB)	ND
Heptabrominated Biphenyls (HeptaBB)	ND
Octabrominated Biphenyls (OctaBB)	ND
Nonabrominated Biphenyls (NonaBB)	ND
Decabrominated Biphenyl (DecaBB)	ND
Polybrominated Diphenyl Ethers (PBDEs)	
Monobrominated Diphenyl Ethers (MonoBDE)	ND
Dibrominated Diphenyl Ethers (DiBDE)	ND
Tribrominated Diphenyl Ethers (TriBDE)	ND
Tetrabrominated Diphenyl Ethers (TetraBDE)	ND
Pentabrominated Diphenyl Ethers (PentaBDE)	ND
Hexabrominated Diphenyl Ethers (HexaBDE)	ND
Heptabrominated Diphenyl Ethers (HeptaBDE)	ND
Octabrominated Diphenyl Ethers (OctaBDE)	ND
Nonabrominated Diphenyl Ethers (NonaBDE)	ND
Decabrominated Diphenyl Ether (DecaBDE)	ND
Halogen Content	
Fluorine (F)	ND
Chlorine (Cl)	ND
Bromine (Br)	ND
Iodine (I)	ND

Remarks: ppm = Parts per million based on weight of tested sample = mg/kg

ND = Not detected

Responsibility of Chemist : Irene Chiou / Kevin Liu / Cathy Chen

Date Sample Received : Oct 24, 2012

Test Period : Oct 25, 2012 To Oct 30, 2012





Number: TWNC00282887

## Test Conducted

## ( $\Pi$ ) RoHS Limits:

Restricted Substances	<u>Limits</u>
Cadmium (Cd) Content	0.01% (100ppm)
Lead (Pb) Content	0.1% (1000ppm)
Mercury (Hg) Content	0.1% (1000ppm)
Chromium VI (Cr <sup>6+</sup> ) Content	0.1% (1000ppm)
Polybrominated Biphenyls (PBBs)	0.1% (1000ppm)
Polybrominated Diphenyl Ehters (PBDEs)	0.1% (1000ppm)

The above limits were quoted from Annex II of 2011/65/EU for homogeneous material.

## (Ⅲ) Test Method:

Test Item	Test Method	Reporting Limit
Cadmium (Cd) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Lead (Pb) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Mercury (Hg) content	With reference to IEC 62321 edition 1.0:2008 in clause 7, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Chromium VI (Cr <sup>6+</sup> ) content	With reference to IEC 62321 edition 1.0:2008 in annex C, by alkaline digestion and determined by UV-Vis spectrophotometer.	1 ppm





Number: TWNC00282887

# Test Conducted

## (Ⅲ) Test Method:

Test Item	Test Method	Reporting Limit
Polybrominated Biphenyls (PBBs)	With reference to IEC 62321 edition 1.0:2008 in annex A, by solvent extraction and determined by GC-MS and further HPLC-DAD confirmation when necessary.	5 ppm
Polybrominated Diphenyl Ethers (PBDEs)	With reference to IEC 62321 edition 1.0:2008 in annex A, by solvent extraction and determined by GC-MS and further HPLC-DAD confirmation when necessary.	5 ppm
Halogen Content	With reference to EN 14582:2007 by calorimetric bomb with oxygen and determined by Ion Chromatograph.	50 ppm

Remark: Reporting limit = Quantitation limit of analyte in sample





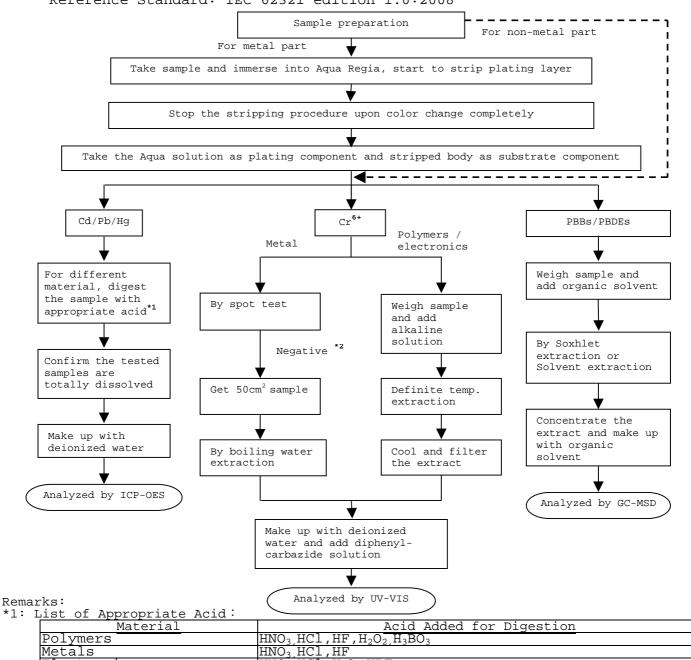
Number : TWNC00282887

#### Test Conducted

(IV) Measurement Flowchart:

Electronics

Test for Cd/Pb/Hg/Chromium (VI)/PBBS/PBDES Contents Reference Standard: IEC 62321 edition 1.0:2008



\*2: If the result of spot test is positive, Chromium VI would be determined as detected.

HNO3 HCl, H2O2 HBF4



Page 5 of 7

## Intertek Testing Services Taiwan Ltd.

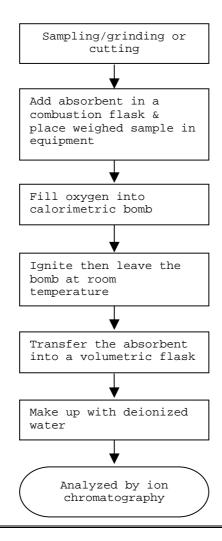


Number: TWNC00282887

Test Conducted

(N) Measurement Flowchart:

Test for Halogen Content Reference Standard: EN 14582



End of Report

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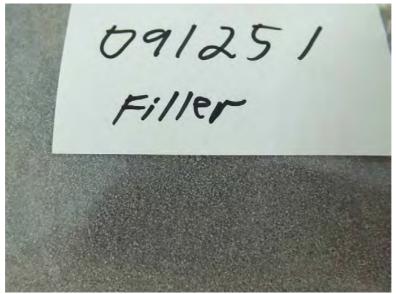


Test Conducted

Number: TWNC00282887

#### Photo









DATE:

DEC 10, 2012

APPLICANT: LITTELFUSE,INC.

800 E. NORTHWEST HWY

ATTN: A.DIVIETRO/D.UNTIEDT

SAMPLE DESCRIPTION:

ONE(1) SUBMITTED SAMPLE SAID TO BE WHITE SAND. ITEM NAME SAND. PART NO. 091254.

**TESTS CONDUCTED:** 

AS REQUESTED BY THE APPLICANT, FOR DETAILS REFER TO ATTACHED PAGE(S)

TO BE CONTINUED

**AUTHORIZED BY:** FOR INTERTEK TESTING SERVICES LTD., SHANGHAI

JACOB LIN

**GENERAL MANAGER** 



#### **TESTS CONDUCTED**

## 1 (I) TEST RESULT SUMMARY:

TESTING ITEM	RESULT (ppm)
HEAVY METAL	,
CADMIUM (Cd) CONTENT	ND
LEAD (Pb) CONTENT	ND
MERCURY (Hg) CONTENT	ND
CHROMIUM VI (Cr <sup>6+</sup> ) CONTENT	ND
POLYBROMINATED BIPHENYLS (PBBs)	
MONOBROMINATED BIPHENYLS (MonoBB)	ND
DIBROMINATED BIPHENYLS (DiBB)	ND
TRIBROMINATED BIPHENYLS (TriBB)	ND
TETRABROMINATED BIPHENYLS (TetraBB)	ND
PENTABROMINATED BIPHENYLS (PentaBB)	ND
HEXABROMINATED BIPHENYLS (HexaBB)	ND
HEPTABROMINATED BIPHENYLS (HeptaBB)	ND
OCTABROMINATED BIPHENYLS (OctaBB)	ND
NONABROMINATED BIPHENYLS (NonaBB)	ND
DECABROMINATED BIPHENYL (DecaBB)	ND
POLYBROMINATED DIPHENYL ETHERS (PBDEs)	
MONOBROMINATED DIPHENYL ETHERS (MonoBDE)	ND
DIBROMINATED DIPHENYL ETHERS (DIBDE)	ND
TRIBROMINATED DIPHENYL ETHERS (TriBDE)	ND
TETRABROMINATED DIPHENYL ETHERS (TetraBDE)	ND
PENTABROMINATED DIPHENYL ETHERS (PentaBDE)	ND
HEXABROMINATED DIPHENYL ETHERS (HexaBDE)	ND
HEPTABROMINATED DIPHENYL ETHERS (HeptaBDE)	ND
OCTABROMINATED DIPHENYL ETHERS (OctaBDE)	ND
NONABROMINATED DIPHENYL ETHERS (NonaBDE)	ND
DECABROMINATED DIPHENYL ETHER (DecaBDE)	ND
HALOGEN CONTENT	
FLUORINE (F)	ND
CHLORINE (CI)	ND
BROMINE (Br)	ND
IODINE (I)	ND

REMARKS: ppm = PARTS PER MILLION = mg/kg

ND = NOT DETECTED

RESPONSIBILITY OF CHEMIST: DENT FANG / LEAF LIU

#### (II) ROHS REQUIREMENT:

RESTRICTED SUBSTANCES	<u>LIMITS</u>
CADMIUM (Cd) CONTENT	0.01% (100ppm)
LEAD (Pb) CONTENT	0.1% (1000ppm)
MERCURY (Hg) CONTENT	0.1% (1000ppm)
CHROMIUM VI (Cr <sup>6+</sup> ) CONTENT	0.1% (1000ppm)
POLYBROMINATED BIPHENYLS (PBBs)	0.1% (1000ppm)
POLYBROMINATED DIPHENYL ETHERS (PBDEs)	0.1% (1000ppm)

THE ABOVE LIMITS WERE QUOTED FROM ROHS DIRECTIVE 2002/95/EC AND AMENDMENT 2005/618/EC FOR HOMOGENEOUS MATERIAL.



## **TESTS CONDUCTED**

## (III) TEST METHOD:

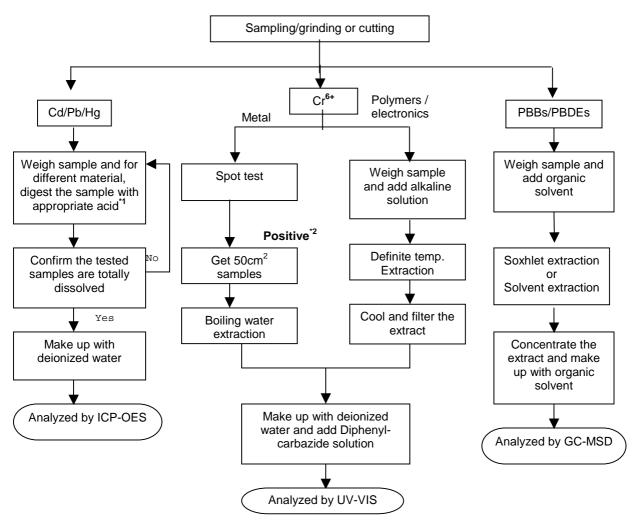
TESTING ITEM	TESTING METHOD	REPORTING LIMIT
CADMIUM (Cd) CONTENT	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008 IN CLAUSE 8/9/10, BY MICROWAVE DIGESTION UNTIL THE TESTED SAMPLES ARE TOTALLY DISSOLVED AND DETERMINED BY ICP-OES.	2 ppm
LEAD (Pb) CONTENT	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008 IN CLAUSE 8/9/10, BY MICROWAVE DIGESTION UNTIL THE TESTED SAMPLES ARE TOTALLY DISSOLVED AND DETERMINED BY ICP-OES.	2 ppm
MERCURY (Hg) CONTENT	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008 IN CLAUSE 7, BY MICROWAVE DIGESTION UNTIL THE TESTED SAMPLES ARE TOTALLY DISSOLVED AND DETERMINED BY ICP-OES.	2 ppm
CHROMIUM VI (CR <sup>6+</sup> ) CONTENT	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008 IN ANNEX C, BY ALKALINE DIGESTION AND DETERMINED BY UV-VIS SPECTROPHOTOMETER.	1 ppm
POLYBROMINATED BIPHENYLS (PBBs)	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008 IN ANNEX A, BY SOLVENT EXTRACTION AND DETERMINED BY GC-MSD AND FURTHER HPLC CONFIRMATION WHEN NECESSARY.	5 ppm
POLYBROMINATED DIPHENYL ETHERS (PBDEs)	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008 IN ANNEX A, BY SOLVENT EXTRACTION AND DETERMINED BY GC-MSD AND FURTHER HPLC CONFIRMATION WHEN NECESSARY.	5 ppm

REMARK: REPORTING LIMIT = QUANTITATION LIMIT OF ANALYZE IN SAMPLE



#### **TESTS CONDUCTED**

(IV) MEASUREMENT FLOWCHART: TEST FOR Cd/ Pb/ Hg/Cr (VI)/ PBBS/PBDES CONTENTS REFERENCE STANDARD: IEC 62321 EDITION 1.0:2008



#### **REMARKS:**

\*1: LIST OF APPROPRIATE ACID:

I. LIGI OF AFTINOTRIA	IL AOID:
MATERIAL	ACID ADDED FOR DIGESTION
POLYMERS	HNO <sub>3</sub> ,HCL,HF,H <sub>2</sub> O <sub>2</sub> ,H <sub>3</sub> BO <sub>3</sub>
METALS	HNO <sub>3,</sub> HCL,HF
ELECTRONICS	HNO <sub>3</sub> ,HCL,H <sub>2</sub> O <sub>2</sub> ,HBF <sub>4</sub>

\*2: IF THE RESULT OF SPOT TEST IS POSITIVE, CHROMIUM (VI) WOULD BE DETERMINED AS DETECTED.



## **TESTS CONDUCTED**

#### (I) TEST RESULT SUMMARY: 2

TESTING ITEM RESULT (ppm)	
HALOGEN CONTENT	
FLUORINE (F)	ND
CHLORINE (CI)	ND
BROMINE (Br)	ND
IODINE (I)	ND

REMARKS: ppm = PARTS PER MILLION = mg/kg

ND = NOT DETECTED

RESPONSIBILITY OF CHEMIST : GRAVE WANG

#### (III) TEST METHOD:

TESTING ITEM	TESTING METHOD	REPORTING LIMIT
HALOGEN CONTENT	WITH REFERENCE TO EN 14582:2007 BY COMBUSTION FLASK WITH OXYGEN AND DETERMINED BY ION CHROMATOGRAPHY	50 ppm

REMARK: REPORTING LIMIT = QUANTITATION LIMIT OF ANALYTE IN SAMPLE

DATE SAMPLE RECEIVED : DEC.5, 2012

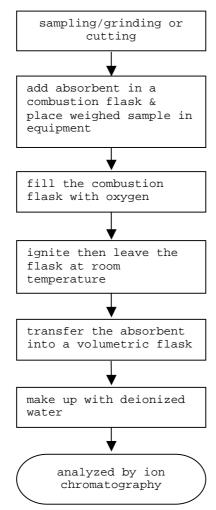
TESTING PERIOD: DEC.5, 2012 TO DEC.7, 2012



## **TESTS CONDUCTED**

#### (IV) MEASUREMENT FLOWCHART:

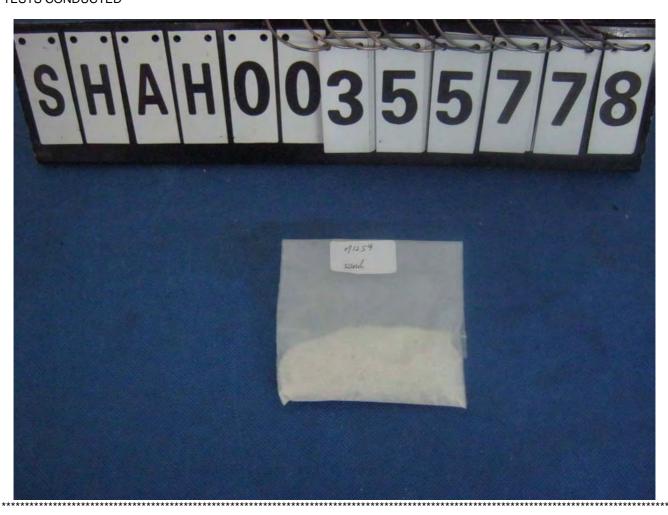
**TEST FOR HALOGEN CONTENT** REFERENCE STANDARD: EN 14582





**TESTS CONDUCTED** 

NUMBER: SHAH00355778



**END OF REPORT** 

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APPLICANT: LITTELFUSE, INC. DATE: OCT 29, 2012

800 E. NORTHWEST HWY ΑT A.DIVIETRO/D.UNTIEDT

SAMPLE DESCRIPTION:

ONE (1) SUBMITTED SAMPLE SAID TO BE **ORANGE INK.** PART DESCRIPTION INK-ORANGE. 425900. PART NUMBER

DATE SAMPLE RECEIVED OCTOBER.15, 2012. DATE TEST STARTED OCTOBER.15, 2012.

TESTS CONDUCTED:

AS REQUESTED BY THE APPLICANT, FOR DETAILS REFER TO ATTACHED PAGE(S)

TO BE CONTINUED

**AUTHORIZED BY:** FOR INTERTEK TESTING SERVICES LTD., SHANGHAI

JACOB LIN

**GENERAL MANAGER** 



## **TESTS CONDUCTED**

#### I) Test Result Summary:

<u>Testing Item</u>	Result (ppm)
Heavy Metal	
Cadmium (Cd) content	ND
Lead (Pb) content	ND
Mercury (Hg) content	ND
Chromium VI (Cr <sup>6+</sup> ) content	ND
Polybrominated Biphenyls (PBBs)	
Monobrominated Biphenyls (MonoBB)	ND
Dibrominated Biphenyls (DiBB)	ND
Tribrominated Biphenyls (TriBB)	ND
Tetrabrominated Biphenyls (TetraBB)	ND
Pentabrominated Biphenyls (PentaBB)	ND
Hexabrominated Biphenyls (HexaBB)	ND
Heptabrominated Biphenyls (HeptaBB)	ND
Octabrominated Biphenyls (OctaBB)	ND
Nonabrominated Biphenyls (NonaBB)	ND
Decabrominated Biphenyl (DecaBB)	ND
Polybrominated Diphenyl Ethers (PBDEs)	
Monobrominated Diphenyl Ethers (MonoBDE)	ND
Dibrominated Diphenyl Ethers (DiBDE)	ND
Tribrominated Diphenyl Ethers (TriBDE)	ND
Tetrabrominated Diphenyl Ethers (TetraBDE)	ND
Pentabrominated Diphenyl Ethers (PentaBDE)	ND
Hexabrominated Diphenyl Ethers (HexaBDE)	ND
Heptabrominated Diphenyl Ethers (HeptaBDE)	ND
Octabrominated Diphenyl Ethers (OctaBDE)	ND
Nonabrominated Diphenyl Ethers (NonaBDE)	ND
Decabrominated Diphenyl Ether (DecaBDE)	ND

# (III) Test Method:

(III) Test Method.		
Testing Item T	esting Method R	eporting Limit
Cadmium (Cd) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Lead (Pb) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Mercury (Hg) content	With reference to IEC 62321 edition 1.0:2008 in clause 7, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Chromium VI (Cr <sup>6+</sup> ) content  With reference to IEC 62321 edition 1.0:2008 in annex C, by alkaline digestion and determined by UV-Vis spectrophotometer.		1 ppm
Polybrominated Biphenyls (PBBs)	With reference to IEC 62321 edition 1.0:2008 in annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
Polybrominated Diphenyl Ethers (PBDEs)	With reference to IEC 62321 edition 1.0:2008 in annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm

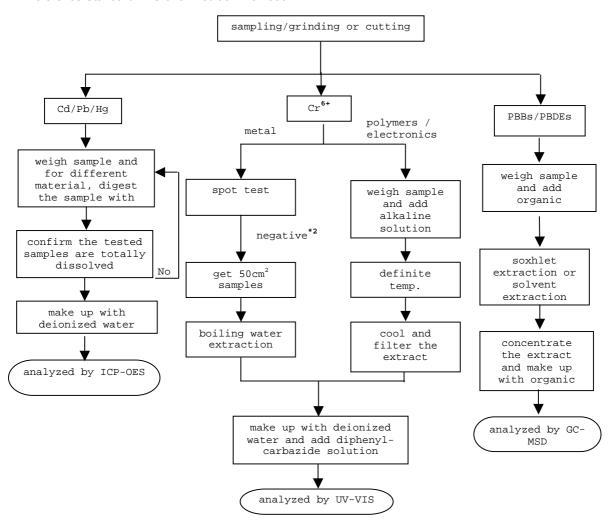
Remark: Reporting limit = Quantitation limit of analyte in sample



#### **TESTS CONDUCTED**

(IV) Measurement Flowchart:

Test For Cd/Pb/Hg/Chromium (VI)/PBBs/PBDEs Contents Reference Standard: IEC 62321 edition 1.0:2008



## REMARKS:

\*1: List of appropriate acid

i oi appropriate aciu:	
<u>Material</u>	Acid added for digestion
Polymers HNO	3,HCl,HF,H2O2,H3BO3
Metals HNO	<sub>3,</sub> HCl,HF
Electronics H	NO <sub>3</sub> ,HCI,H <sub>2</sub> O <sub>2</sub> ,HBF <sub>4</sub>

\*2: If the result of spot test is positive, Chromium VI would be determined as detected.



## **TESTS CONDUCTED**

2 ( I) Test Result Summary:

	Testing Item	Result (ppm)
Halogen Content		<u> </u>
Fluorine (F)		ND
Chlorine (CI)		14500
Bromine (Br)		ND
lodine (I)		ND

ppm = Parts per million = mg/kg Remarks:

= Not detected

Responsibility Of Chemist : LEAF LIU

## (III) Test Method:

Testing Item T	esting Method R	eporting Limit
nalooen Conieni	With reference to EN 14582:2007 by combustion flask with oxygen and determined by ion chromatography	50 ppm

Reporting limit = Quantitation limit of analyte in sample Remark:

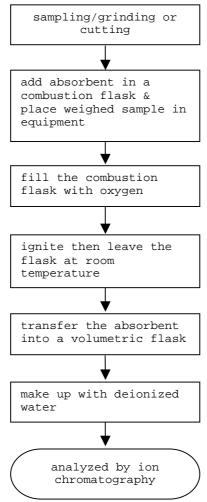


## **TEST REPORT**

**TESTS CONDUCTED** 

( ${\rm IV}$ ) Measurement Flowchart:

Test For Halogen Content Reference Standard: EN 14582



NUMBER: SH

AH00345629



**TESTS CONDUCTED** 

(A) TEST RESULT SUMMARY:

TESTING ITEM R	ESULT(ppm)
HBCD (HEXABROMOCYCLODODECANE)	ND

**REMARKS**:

ppm = PARTS PER MILLION = mg/kg ND = NOT DETECTED

(B) TEST METHOD:

TESTING ITEM T	ESTING METHOD REPORT	ING LIMIT
HBCD (HEXABROMOCYCLODODECANE)	WITH REFERENCE TO USEPA 3540C, BY SOLVENT EXTRACTION AND DETERMINED BY GC/MS	10 ppm



#### **TEST REPORT**

NUMBER: SH AH00345629

#### **TESTS CONDUCTED** MEASUREMENT FLOWCHART

TEST FOR HBCD (HEXABROMOCYCLODODECANE) CONTENT

WEIGH SAMPLE AND PLACE INTO A THIMBLE SOXHLET EXTRACTION WITH ORGANIC SOLVENT IJ CONCENTRATE THE EXTRACT TRANSFER THE EXTRACT INTO A VOLUMETRIC FLASK  $\mathbf{1}$ MAKE UP WITH ORGANIC SOLVENT Ŋ ANALYZE BY GC-MSD

TO BE CONTINUED



#### **TESTS CONDUCTED**

#### 4 PHTHALATE CONTENT TEST

WITH REFERENCE TO EN14372, BY GAS CHROMATOGRAPHY-MASS SPECTROMETRY (GC-MS) ANALYSIS.

TESTED COMPOUND RESULT	(%,W/W)	LIMIT(%,W/W)
		<u>(MAX.)</u>
DIBUTYL PHTHALATE (DBP)	ND	
DI(2-ETHYL HEXYL) PHTHALATE(DEHP)	ND	
BENZYL BUTYL PHTHALATE (BBP)	ND	
SUM OF THREE PHTHALATES	ND	0.1

REMARK: THE ABOVE LIMIT WAS QUOTED ACCORDING TO ANNEX XVII

ITEMS 51 & 52 OF THE REACH REGULATION (EC) NO. 1907/2006 & AMENDENT NO.552/2009

FOR PHTHALATE CONTENT IN TOYS AND CHILDREN CARE ARTICLES.

DETECTION LIMIT = 0.01%(W/W)

ND = NOT DETECTED

#### 5 PHTHALATE CONTENT TEST

WITH REFERENCE TO CPSC-CH-C1001-09.3, BY GAS CHROMATOGRAPHY-MASS SPECTROMETRY (GC-MS) ANALYSIS.

TESTED COMPOUND RESULT	(%,W/W)	<u>LIMIT(%,W/W)</u>
		(MAX.)
DI-BUTYL PHTHALATE (DBP)	ND	0.1
DI(2-ETHYL HEXYL) PHTHALATE(DEHP)	ND	0.1
BENZYL BUTYL PHTHALATE (BBP)	ND	0.1

REMARK: THE ABOVE LIMIT WAS QUOTED ACCORDING TO US CONSUMER

PRODUCT SAFETY IMPROVEMENT ACT 2008 & AMENDMENT H.R.2715 FOR PROHIBITION ON

SALE OF CERTAIN PRODUCTS CONTAINING SPECIFIED PHTHALATES.

DETECTION LIMIT = 0.01%(W/W)

ND = NOT DETECTED

DATE SAMPLE RECEIVED: OCT.15, 2012

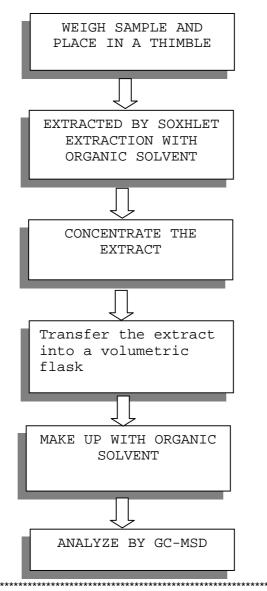
TESTING PERIOD: OCT.15, 2012 TO OCT.18, 2012



**TESTS CONDUCTED** 

#### **MEASUREMENT FLOWCHART:**

TEST FOR PHTHALATES CONTENTS (EN14372)

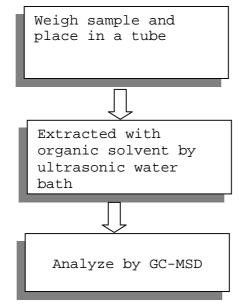




**TESTS CONDUCTED** 

#### **MEASUREMENT FLOWCHART:**

TEST FOR PHTHALATES CONTENTS (CPSC-CH-C1001-09.3)





**TESTS CONDUCTED** 





**END OF REPORT** 

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APPLICANT: LITTELFUSE, INC. DATE: OCT 29, 2012

800 E. NORTHWEST HWY A.DIVIETRO/D.UNTIEDT ATT

SAMPLE DESCRIPTION:

ONE (1) SUBMITTED SAMPLE SAID TO BE RED INK. PART DESCRIPTION INK-RED. PART NUMBER 425901.

DATE SAMPLE RECEIVED OCTOBER.19, 2012. DATE TEST STARTED OCTOBER.19, 2012.

**TESTS CONDUCTED:** 

AS REQUESTED BY THE APPLICANT, FOR DETAILS REFER TO ATTACHED PAGE(S)

TO BE CONTINUED

**AUTHORIZED BY:** FOR INTERTEK TESTING SERVICES LTD., SHANGHAI

JACOB LIN

**GENERAL MANAGER** 



#### **TEST REPORT**

**TESTS CONDUCTED** 

## I) Test Result Summary:

Testing Item	Result (ppm)
Heavy Metal	·
Cadmium (Cd) content	ND
Lead (Pb) content	ND
Mercury (Hg) content	ND
Chromium VI (Cr <sup>6+</sup> ) content	ND
Polybrominated Biphenyls (PBBs)	
Monobrominated Biphenyls (MonoBB)	ND
Dibrominated Biphenyls (DiBB)	ND
Tribrominated Biphenyls (TriBB)	ND
Tetrabrominated Biphenyls (TetraBB)	ND
Pentabrominated Biphenyls (PentaBB)	ND
Hexabrominated Biphenyls (HexaBB)	ND
Heptabrominated Biphenyls (HeptaBB)	ND
Octabrominated Biphenyls (OctaBB)	ND
Nonabrominated Biphenyls (NonaBB)	ND
Decabrominated Biphenyl (DecaBB)	ND
Polybrominated Diphenyl Ethers (PBDEs)	·
Monobrominated Diphenyl Ethers (MonoBDE)	ND
Dibrominated Diphenyl Ethers (DiBDE)	ND
Tribrominated Diphenyl Ethers (TriBDE)	ND
Tetrabrominated Diphenyl Ethers (TetraBDE)	ND
Pentabrominated Diphenyl Ethers (PentaBDE)	ND
Hexabrominated Diphenyl Ethers (HexaBDE)	ND
Heptabrominated Diphenyl Ethers (HeptaBDE)	ND
Octabrominated Diphenyl Ethers (OctaBDE)	ND
Nonabrominated Diphenyl Ethers (NonaBDE)	ND
Decabrominated Diphenyl Ether (DecaBDE)	ND

NUMBER: SH

AH00346635

## (III) Test Method:

esting Method R	eporting Limit
With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
With reference to IEC 62321 edition 1.0:2008 in clause 7, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
With reference to IEC 62321 edition 1.0:2008 in annex C, by alkaline digestion and determined by UV-Vis spectrophotometer.	1 ppm
With reference to IEC 62321 edition 1.0:2008 in annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
With reference to IEC 62321 edition 1.0:2008 in annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.  With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.  With reference to IEC 62321 edition 1.0:2008 in clause 7, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.  With reference to IEC 62321 edition 1.0:2008 in annex C, by alkaline digestion and determined by UV-Vis spectrophotometer.  With reference to IEC 62321 edition 1.0:2008 in annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.  With reference to IEC 62321 edition 1.0:2008 in annex A, by solvent extraction and determined by GC-MSD and further

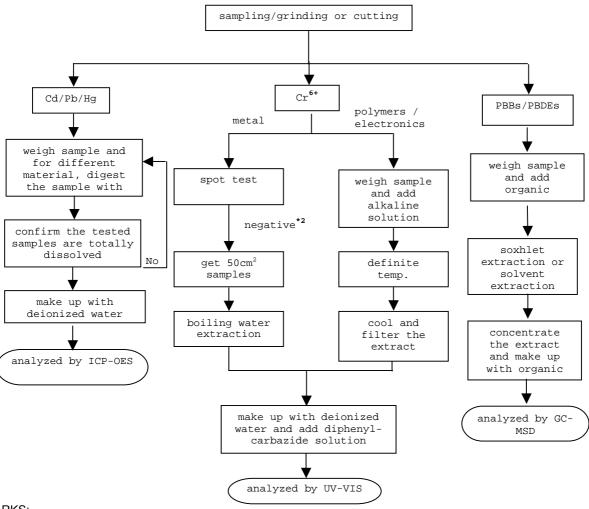
Remark: Reporting limit = Quantitation limit of analyte in sample



#### **TESTS CONDUCTED**

(IV) Measurement Flowchart:

Test For Cd/Pb/Hg/Chromium (VI)/PBBs/PBDEs Contents Reference Standard: IEC 62321 edition 1.0:2008



#### **REMARKS:**

\*1: List of appropriate acid:

1. List of appropriate acid:	
<u>Material</u>	Acid added for digestion
Polymers	HNO <sub>3,</sub> HCI,HF,H <sub>2</sub> O <sub>2,</sub> H <sub>3</sub> BO <sub>3</sub>
Metals HNO	<sub>3,</sub> HCl,HF
Electronics H	NO <sub>3</sub> ,HCl,H <sub>2</sub> O <sub>2</sub> ,HBF <sub>4</sub>

\*2: If the result of spot test is positive, Chromium VI would be determined as detected.



## **TESTS CONDUCTED**

## I) Test Result Summary:

Testing Item	Result (ppm)
Halogen Content	
Fluorine (F)	ND
Chlorine (CI)	1000
Bromine (Br)	ND
lodine (I)	ND

ppm = Parts per million = mg/kg Remarks:

ND = Not detected

Responsibility Of Chemist : Leaf Liu

(III) Test Method:

Testing Item T	esting Method R	eporting Limit
IHAIOGEN CONTENT	With reference to EN 14582:2007 by combustion flask with oxygen and determined by ion chromatography	50 ppm

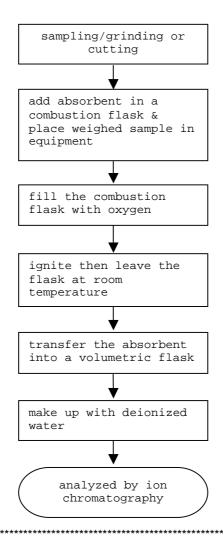
Remark: Reporting limit = Quantitation limit of analyte in sample



#### **TESTS CONDUCTED**

(IV) Measurement Flowchart:

Test For Halogen Content Reference Standard: EN 14582





## **TESTS CONDUCTED**

#### 3 (A) TEST RESULT SUMMARY:

TESTING ITEM R	ESULT(ppm)
HBCD (HEXABROMOCYCLODODECANE)	ND

REMARKS:

ppm = PARTS PER MILLION = mg/kg ND = NOT DETECTED

#### (B) TEST METHOD:

TESTING ITEM TE	STING METHOD	REPORTING LIMIT
HBCD (HEXABROMOCYCLODODECANE)	WITH REFERENCE TO USEPA 3540C, BY SOLVENT EXTRACTION AND DETERMINED BY GC/MS	10 ppm



#### **TEST REPORT**

NUMBER: SH AH00346635

**TESTS CONDUCTED** 

## **MEASUREMENT FLOWCHART:**

TEST FOR HBCD (HEXABROMOCYCLODODECANE) CONTENT

WEIGH SAMPLE AND PLACE INTO A THIMBLE IJ SOXHLET EXTRACTION WITH ORGANIC SOLVENT CONCENTRATE THE EXTRACT TRANSFER THE EXTRACT INTO A VOLUMETRIC FLASK IJ MAKE UP WITH ORGANIC SOLVENT IJ ANALYZE BY GC-MSD



#### **TESTS CONDUCTED**

## 4 PHT HALATE CONTENT TEST

WITH REFERENCE TO EN14372, BY GAS CHROMATOGRAPHY-MASS SPECTROMETRY (GC-MS) ANALYSIS.

TESTED COMPOUND R	<u>ESULT (%,W/W)</u>	LIMIT(%,W/W)
		(MAX.)
DIBUTYL PHTHALATE (DBP)	ND	
DI(2-ETHYL HEXYL) PHTHALATE(DEHP)	ND	
BENZYL BUTYL PHTHALATE (BBP)	ND	
SUM OF THREE PHTHALATES	ND	0.1

REMARK: THE ABOVE LIMIT WAS QUOTED ACCORDING TO ANNEX XVII ITEMS 51 & 52 OF THE REACH

REGULATION (EC) NO. 1907/2006 & AMENDENT NO.552/2009 FOR PHTHALATE CONTENT IN TOYS

AND CHILDREN CARE ARTICLES.

DETECTION LIMIT = 0.01%(W/W)

ND = NOT DETECTED

#### 5 PHT HALATE CONTENT TEST

WITH REFERENCE TO CPSC-CH-C1001-09.3, BY GAS CHROMATOGRAPHY-MASS SPECTROMETRY (GC-MS) ANALYSIS.

TESTED COMPOUND R	<u>ESULT (%,W/W)</u>	LIMIT(%,W/W)
		(MAX.)
DI-BUTYL PHTHALATE (DBP)	ND	0.1
DI(2-ETHYL HEXYL) PHTHALATE(DEHP)	ND	0.1
BENZYL BUTYL PHTHALATE (BBP)	ND	0.1

REMARK: THE ABOVE LIMIT WAS QUOTED ACCORDING TO US CONSUMER PRODUCT SAFETY

IMPROVEMENT ACT 2008 & AMENDMENT H.R.2715 FOR PROHIBITION ON SALE OF CERTAIN

PRODUCTS CONTAINING SPECIFIED PHTHALATES.

DETECTION LIMIT = 0.01%(W/W)

ND = NOT DETECTED

DATE SAMPLE RECEIVED: OCT.19, 2012

TESTING PERIOD: OCT.19, 2012 TO OCT.23, 2012

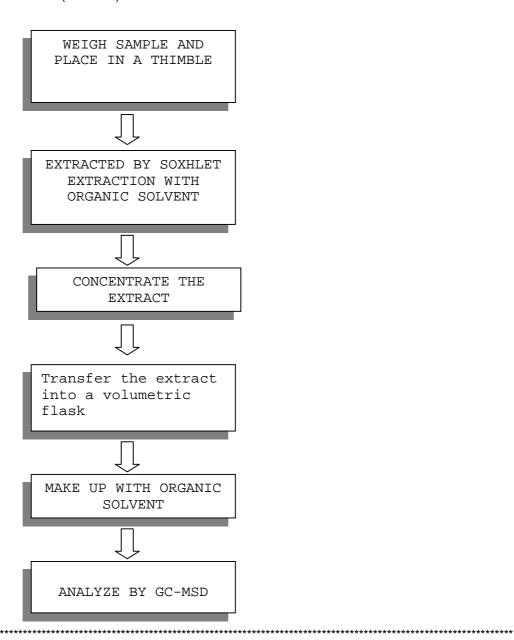


**TEST REPORT** 

NUMBER: SH AH00346635

**TESTS CONDUCTED** MEASUREMENT FLOWCHART:

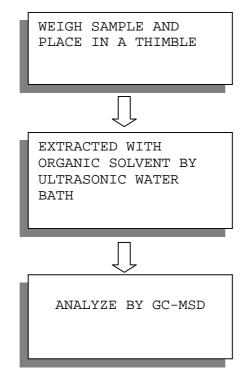
TEST FOR PHTHALATES CONTENTS (EN14372)





**TESTS CONDUCTED** MEASUREMENT FLOWCHART:

TEST FOR PHTHALATES CONTENTS (CPSC-CH-C1001-09.3)





**TESTS CONDUCTED** 



**END OF REPORT** 

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APPLICANT: LITTELFUSE,INC. DATE:

800 E. NORTHWEST HWY

A.DIVIETRO/D.UNTIEDT ATT

SAMPLE DESCRIPTION:

ONE (1) SUBMITTED SAMPLE SAID TO BE **BLACK INK.** PART DESCRIPTION INK-BLACK. 425902. PART NUMBER

DATE SAMPLE RECEIVED OCTOBER.15, 2012. DATE TEST STARTED OCTOBER.15, 2012.

TESTS CONDUCTED:

AS REQUESTED BY THE APPLICANT, FOR DETAILS REFER TO ATTACHED PAGE(S)

TO BE CONTINUED

OCT 29, 2012

**AUTHORIZED BY:** FOR INTERTEK TESTING SERVICES LTD., SHANGHAI

JACOB LIN

**GENERAL MANAGER** 



#### **TEST REPORT**

**TESTS CONDUCTED** 

## I) Test Result Summary:

Testing Item	Result (ppm)			
Heavy Metal				
Cadmium (Cd) content	ND			
Lead (Pb) content	ND			
Mercury (Hg) content	ND			
Chromium VI (Cr <sup>6+</sup> ) content	ND			
Polybrominated Biphenyls (PBBs)				
Monobrominated Biphenyls (MonoBB)	ND			
Dibrominated Biphenyls (DiBB)	ND			
Tribrominated Biphenyls (TriBB)	ND			
Tetrabrominated Biphenyls (TetraBB)	ND			
Pentabrominated Biphenyls (PentaBB)	ND			
Hexabrominated Biphenyls (HexaBB)	ND			
Heptabrominated Biphenyls (HeptaBB)	ND			
Octabrominated Biphenyls (OctaBB)	ND			
Nonabrominated Biphenyls (NonaBB)	ND			
Decabrominated Biphenyl (DecaBB)	ND			
Polybrominated Diphenyl Ethers (PBDEs)				
Monobrominated Diphenyl Ethers (MonoBDE)	ND			
Dibrominated Diphenyl Ethers (DiBDE)	ND			
Tribrominated Diphenyl Ethers (TriBDE)	ND			
Tetrabrominated Diphenyl Ethers (TetraBDE)	ND			
Pentabrominated Diphenyl Ethers (PentaBDE)	ND			
Hexabrominated Diphenyl Ethers (HexaBDE)	ND			
Heptabrominated Diphenyl Ethers (HeptaBDE)	ND			
Octabrominated Diphenyl Ethers (OctaBDE)	ND			
Nonabrominated Diphenyl Ethers (NonaBDE)	ND			
Decabrominated Diphenyl Ether (DecaBDE)	ND			

NUMBER: SH

AH00345635

## (III) Test Method:

(III) Test Method.		
Testing Item T	esting Method R	eporting Limit
Cadmium (Cd) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Lead (Pb) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Mercury (Hg) content	With reference to IEC 62321 edition 1.0:2008 in clause 7, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Chromium VI (Cr <sup>6+</sup> ) content	With reference to IEC 62321 edition 1.0:2008 in annex C, by alkaline digestion and determined by UV-Vis spectrophotometer.	1 ppm
Polybrominated Biphenyls (PBBs)	With reference to IEC 62321 edition 1.0:2008 in annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
Polybrominated Diphenyl Ethers (PBDEs)	With reference to IEC 62321 edition 1.0:2008 in annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm

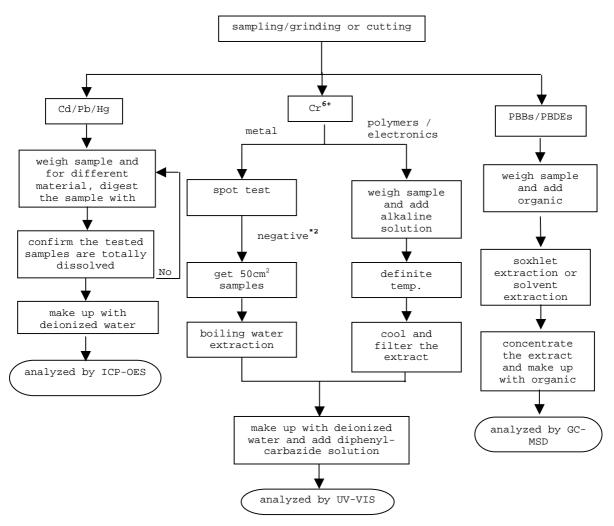
Reporting limit = Quantitation limit of analyte in sample Remark:



#### **TESTS CONDUCTED**

#### (IV) Measurement Flowchart:

Test For Cd/Pb/Hg/Chromium (VI)/PBBs/PBDEs Contents Reference Standard: IEC 62321 edition 1.0:2008



# **REMARKS:**

\*1: List of appropriate acid:

<u>Material</u>	Acid added for digestion
Polymers	HNO <sub>3,</sub> HCl,HF,H <sub>2</sub> O <sub>2,</sub> H <sub>3</sub> BO <sub>3</sub>
Metals HNO	3,HCI,HF
Electronics H	NO <sub>3,</sub> HCI,H <sub>2</sub> O <sub>2,</sub> HBF <sub>4</sub>

\*2: If the result of spot test is positive, Chromium VI would be determined as detected.



# **TESTS CONDUCTED**

# I) Test Result Summary:

Testing Item	Result (ppm)
Halogen Content	
Fluorine (F)	ND
Chlorine (CI)	150
Bromine (Br)	ND
lodine (I)	ND

Remarks: ppm = Parts per million = mg/kg

ND = Not detected

Responsibility Of Chemist : Leaf Liu

## (III) Test Method:

Testing Item T	esting Method R	eporting Limit
IHAIOOEN CONIENT	With reference to EN 14582:2007 by combustion flask with oxygen and determined by ion chromatography	50 ppm

Reporting limit = Quantitation limit of analyte in sample Remark:

TO BE CONTINUED

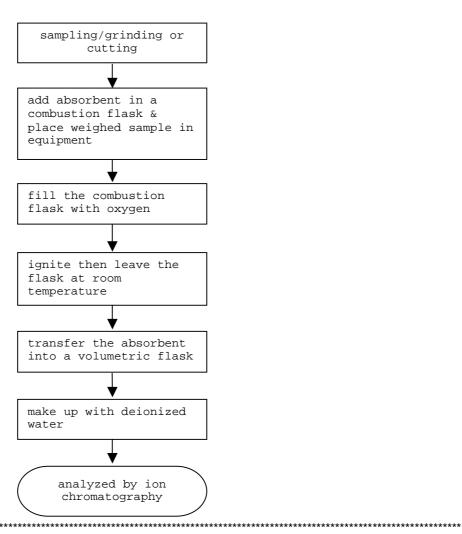
AH00345635



# **TESTS CONDUCTED**

(IV) Measurement Flowchart:

Test For Halogen Content Reference Standard: EN 14582



NUMBER: SH

AH00345635



NUMBER: SH AH00345635

# **TESTS CONDUCTED**

#### 3 (A) TEST RESULT SUMMARY:

TESTING ITEM R	ESULT(ppm)
HBCD (HEXABROMOCYCLODODECANE)	ND

REMARKS:

ppm = PARTS PER MILLION = mg/kg ND = NOT DETECTED

# (B) TEST METHOD:

TESTING ITEM TE	STING METHOD	REPORTING LIMIT
HBCD (HEXABROMOCYCLODODECANE)	WITH REFERENCE TO USEPA 3540C, BY SOLVENT EXTRACTION AND DETERMINED BY GC/MS	10 ppm



**TESTS CONDUCTED** 

# MEASUREMENT FLOWCHART:

TEST FOR HBCD (HEXABROMOCYCLODODECANE) CONTENT

WEIGH SAMPLE AND PLACE INTO A THIMBLE IJ SOXHLET EXTRACTION WITH ORGANIC SOLVENT CONCENTRATE THE EXTRACT TRANSFER THE EXTRACT INTO A VOLUMETRIC FLASK IJ MAKE UP WITH ORGANIC SOLVENT IJ ANALYZE BY GC-MSD

TO BE CONTINUED



#### **TESTS CONDUCTED**

# 4 PHT HALATE CONTENT TEST

WITH REFERENCE TO EN14372, BY GAS CHROMATOGRAPHY-MASS SPECTROMETRY (GC-MS) ANALYSIS.

TESTED COMPOUND R	<u>ESULT (%,W/W)</u>	LIMIT(%,W/W)
		(MAX.)
DIBUTYL PHTHALATE (DBP)	ND	
DI(2-ETHYL HEXYL) PHTHALATE(DEHP)	ND	
BENZYL BUTYL PHTHALATE (BBP)	ND	
SUM OF THREE PHTHALATES	ND	0.1

REMARK: THE ABOVE LIMIT WAS QUOTED ACCORDING TO ANNEX XVII ITEMS 51 & 52 OF THE REACH

REGULATION (EC) NO. 1907/2006 & AMENDENT NO.552/2009 FOR PHTHALATE CONTENT IN TOYS

AND CHILDREN CARE ARTICLES.

DETECTION LIMIT = 0.01%(W/W)

ND = NOT DETECTED

## 5 PHT HALATE CONTENT TEST

WITH REFERENCE TO CPSC-CH-C1001-09.3, BY GAS CHROMATOGRAPHY-MASS SPECTROMETRY (GC-MS) ANALYSIS.

TESTED COMPOUND R	ESULT (%,W/W)	LIMIT(%,W/W)
		(MAX.)
DI-BUTYL PHTHALATE (DBP)	ND	0.1
DI(2-ETHYL HEXYL) PHTHALATE(DEHP)	ND	0.1
BENZYL BUTYL PHTHALATE (BBP)	ND	0.1

REMARK: THE ABOVE LIMIT WAS QUOTED ACCORDING TO US CONSUMER PRODUCT SAFETY

IMPROVEMENT ACT 2008 & AMENDMENT H.R.2715 FOR PROHIBITION ON SALE OF CERTAIN

PRODUCTS CONTAINING SPECIFIED PHTHALATES.

DETECTION LIMIT = 0.01%(W/W)

ND = NOT DETECTED

DATE SAMPLE RECEIVED: OCT.15, 2012

TESTING PERIOD: OCT.15, 2012 TO OCT.18, 2012 

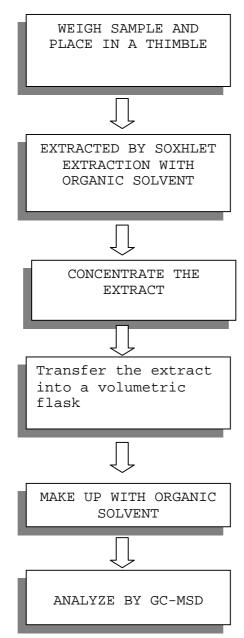


NUMBER: SH AH00345635

## **TESTS CONDUCTED**

MEASUREMENT FLOWCHART:

TEST FOR PHTHALATES CONTENTS (EN14372)

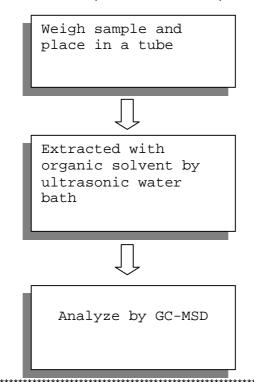




# **TESTS CONDUCTED**

## MEASUREMENT FLOWCHART:

TEST FOR PHTHALATES CONTENTS (CPSC-CH-C1001-09.3)





**TESTS CONDUCTED** 

NUMBER: SH AH00345635

# SHAH00345635

**END OF REPORT** 

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APPLICANT: LITTELFUSE, INC. DATE: OCT 26, 2012

800 E. NORTHWEST HWY ΑT A.DIVIETRO/D.UNTIEDT

SAMPLE DESCRIPTION:

ONE (1) SUBMITTED SAMPLE SAID TO BE YELLOW INK. PART DESCRIPTION INK-YELLOW. 425903. PART NUMBER

DATE SAMPLE RECEIVED OCTOBER.15, 2012. DATE TEST STARTED OCTOBER.15, 2012.

**TESTS CONDUCTED:** 

AS REQUESTED BY THE APPLICANT, FOR DETAILS REFER TO ATTACHED PAGE(S)

TO BE CONTINUED

**AUTHORIZED BY:** FOR INTERTEK TESTING SERVICES LTD., SHANGHAI

JACOB LIN

**GENERAL MANAGER** 



**TESTS CONDUCTED** 

# I) Test Result Summary:

Testing Item	Result (ppm)	
Heavy Metal		
Cadmium (Cd) content	ND	
Lead (Pb) content	ND	
Mercury (Hg) content	ND	
Chromium VI (Cr <sup>6+</sup> ) content	ND	
Polybrominated Biphenyls (PBBs)		
Monobrominated Biphenyls (MonoBB)	ND	
Dibrominated Biphenyls (DiBB)	ND	
Tribrominated Biphenyls (TriBB)	ND	
Tetrabrominated Biphenyls (TetraBB)	ND	
Pentabrominated Biphenyls (PentaBB)	ND	
Hexabrominated Biphenyls (HexaBB)	ND	
Heptabrominated Biphenyls (HeptaBB)	ND	
Octabrominated Biphenyls (OctaBB)	ND	
Nonabrominated Biphenyls (NonaBB)	ND	
Decabrominated Biphenyl (DecaBB)	ND	
Polybrominated Diphenyl Ethers (PBDEs)		
Monobrominated Diphenyl Ethers (MonoBDE)	ND	
Dibrominated Diphenyl Ethers (DiBDE)	ND	
Tribrominated Diphenyl Ethers (TriBDE)	ND	
Tetrabrominated Diphenyl Ethers (TetraBDE)	ND	
Pentabrominated Diphenyl Ethers (PentaBDE)	ND	
Hexabrominated Diphenyl Ethers (HexaBDE)	ND	
Heptabrominated Diphenyl Ethers (HeptaBDE)	ND	
Octabrominated Diphenyl Ethers (OctaBDE)	ND	
Nonabrominated Diphenyl Ethers (NonaBDE)	ND	
Decabrominated Diphenyl Ether (DecaBDE)	ND	

NUMBER: SH

AH00345662

#### (III) Test Method:

eporting Limit
se 8/9/10, totally 2 ppm
se 8/9/10, totally 2 ppm
se 7, by ally 2 ppm
ex C, by photometer. 1 ppm
ex A, by urther 5 ppm
ex A, by urther 5 ppm

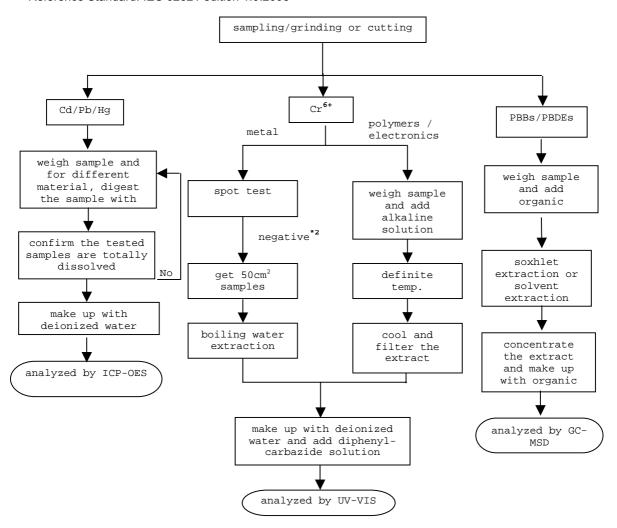
Reporting limit = Quantitation limit of analyte in sample Remark:



#### **TESTS CONDUCTED**

#### (IV) Measurement Flowchart:

Test For Cd/Pb/Hg/Chromium (VI)/PBBs/PBDEs Contents Reference Standard: IEC 62321 edition 1.0:2008



# **REMARKS:**

\*1: List of appropriate acid:

<u>Material</u>	Acid added for digestion
Polymers	HNO <sub>3</sub> ,HCl,HF,H <sub>2</sub> O <sub>2</sub> ,H <sub>3</sub> BO <sub>3</sub>
Metals HNO	<sub>3,</sub> HCl,HF
Electronics H	NO <sub>3,</sub> HCI,H <sub>2</sub> O <sub>2,</sub> HBF <sub>4</sub>

\*2: If the result of spot test is positive, Chromium VI would be determined as detected.



**TESTS CONDUCTED** 

# 2 ( I) Test Result Summary:

Testing Item	Result (ppm)
Halogen Content	
Fluorine (F)	ND
Chlorine (CI)	7400
Bromine (Br)	ND
lodine (I)	ND

NUMBER: SH

AH00345662

ppm = Parts per million = mg/kg Remarks:

Ν = Not detected D

Responsibility Of Chemist : Leaf Liu

## (III) Test Method:

Testing Item T	esting Method R	eporting Limit
	With reference to EN 14582:2007 by combustion flask with oxygen and determined by ion chromatography	50 ppm

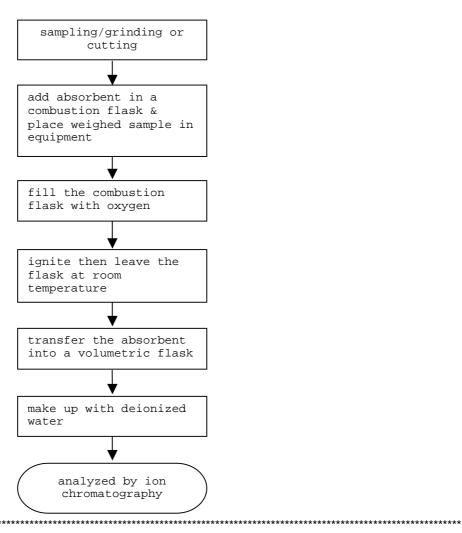
Remark: Reporting limit = Quantitation limit of analyte in sample



# **TESTS CONDUCTED**

(IV) Measurement Flowchart:

Test For Halogen Content Reference Standard: EN 14582



NUMBER: SH

AH00345662



**TESTS CONDUCTED** 

#### 3 (A) TEST RESULT SUMMARY:

TESTING ITEM R	ESULT(ppm)
HBCD (HEXABROMOCYCLODODECANE)	ND

NUMBER: SH

AH00345662

**REMARKS:** 

ppm = PARTS PER MILLION = mg/kg ND = NOT DETECTED

# (B) TEST METHOD:

TESTING ITEM T	ESTING METHOD	REPORTING LIMIT
HBCD (HEXABROMOCYCLODODECANE)	WITH REFERENCE TO USEPA 3540C, BY SOLVENT EXTRACTION AND DETERMINED BY GC/MS	10 ppm



NUMBER: SH AH00345662

## **TESTS CONDUCTED**

## **MEASUREMENT FLOWCHART:**

TEST FOR HBCD (HEXABROMOCYCLODODECANE) CONTENT

WEIGH SAMPLE AND PLACE INTO A THIMBLE IJ SOXHLET EXTRACTION WITH ORGANIC SOLVENT CONCENTRATE THE EXTRACT TRANSFER THE EXTRACT INTO A VOLUMETRIC FLASK IJ MAKE UP WITH ORGANIC SOLVENT IJ ANALYZE BY GC-MSD

TO BE CONTINUED



#### **TESTS CONDUCTED**

#### 4 PHTHALATE CONTENT TEST

WITH REFERENCE TO EN14372, BY GAS CHROMATOGRAPHY-MASS SPECTROMETRY (GC-MS) ANALYSIS.

TESTED COMPOUND RESULT	(%,W/W)	LIMIT(%,W/W)
		(MAX.)
DIBUTYL PHTHALATE (DBP)	ND	
DI(2-ETHYL HEXYL) PHTHALATE(DEHP)	ND	
BENZYL BUTYL PHTHALATE (BBP)	ND	
SUM OF THREE PHTHALATES	ND	0.1

REMARK: THE ABOVE LIMIT WAS QUOTED ACCORDING TO ANNEX XVII ITEMS 51 & 52 OF THE REACH

REGULATION (EC) NO. 1907/2006 & AMENDENT NO.552/2009 FOR PHTHALATE CONTENT IN TOYS

AND CHILDREN CARE ARTICLES.

DETECTION LIMIT = 0.01%(W/W)

ND = NOT DETECTED

## 5 PHTHALATE CONTENT TEST

WITH REFERENCE TO CPSC-CH-C1001-09.3, BY GAS CHROMATOGRAPHY-MASS SPECTROMETRY (GC-MS) ANALYSIS.

TESTED COMPOUND RESULT	(%,W/W)	LIMIT(%,W/W)
		(MAX.)
DI-BUTYL PHTHALATE (DBP)	ND	0.1
DI(2-ETHYL HEXYL) PHTHALATE(DEHP)	ND	0.1
BENZYL BUTYL PHTHALATE (BBP)	ND	0.1

REMARK: THE ABOVE LIMIT WAS QUOTED ACCORDING TO US CONSUMER PRODUCT SAFETY

IMPROVEMENT ACT 2008 & AMENDMENT H.R.2715 FOR PROHIBITION ON SALE OF CERTAIN

PRODUCTS CONTAINING SPECIFIED PHTHALATES.

DETECTION LIMIT = 0.01%(W/W)

ND = NOT DETECTED

DATE SAMPLE RECEIVED: OCT.15, 2012

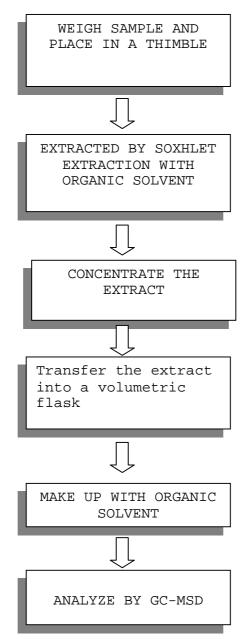
TESTING PERIOD : OCT.15, 2012 TO OCT.19, 2012



**TESTS CONDUCTED** 

## MEASUREMENT FLOWCHART:

TEST FOR PHTHALATES CONTENTS (EN14372)



TO BE CONTINUED

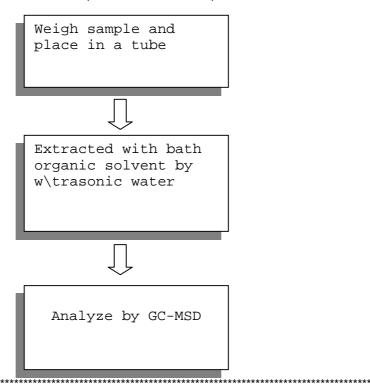
NUMBER: SH AH00345662



# **TESTS CONDUCTED**

## MEASUREMENT FLOWCHART:

TEST FOR PHTHALATES CONTENTS (CPSC-CH-C1001-09.3)





**TESTS CONDUCTED** 

NUMBER: SH AH00345662



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APPLICANT: LITTELFUSE, INC. DATE:

ΑT A.DIVIETRO/D.UNTIEDT

SAMPLE DESCRIPTION:

ONE (1) SUBMITTED SAMPLE SAID TO BE **BLUE INK.** PART DESCRIPTION INK-BLUE. PART NUMBER 425904.

800 E. NORTHWEST HWY

DATE SAMPLE RECEIVED OCTOBER.15, 2012. DATE TEST STARTED OCTOBER.15, 2012.

TESTS CONDUCTED:

AS REQUESTED BY THE APPLICANT, FOR DETAILS REFER TO ATTACHED PAGE(S)

TO BE CONTINUED

OCT 26, 2012

**AUTHORIZED BY:** FOR INTERTEK TESTING SERVICES LTD., SHANGHAI

JACOB LIN

**GENERAL MANAGER** 



# **TESTS CONDUCTED**

# 1 ( I) Test Result Summary:

<u>Testing Item</u>	Result (ppm)
Heavy Metal	
Cadmium (Cd) content	ND
Lead (Pb) content	ND
Mercury (Hg) content	ND
Chromium VI (Cr <sup>6+</sup> ) content	ND
Polybrominated Biphenyls (PBBs)	
Monobrominated Biphenyls (MonoBB)	ND
Dibrominated Biphenyls (DiBB)	ND
Tribrominated Biphenyls (TriBB)	ND
Tetrabrominated Biphenyls (TetraBB)	ND
Pentabrominated Biphenyls (PentaBB)	ND
Hexabrominated Biphenyls (HexaBB)	ND
Heptabrominated Biphenyls (HeptaBB)	ND
Octabrominated Biphenyls (OctaBB)	ND
Nonabrominated Biphenyls (NonaBB)	ND
Decabrominated Biphenyl (DecaBB)	ND
Polybrominated Diphenyl Ethers (PBDEs)	
Monobrominated Diphenyl Ethers (MonoBDE)	ND
Dibrominated Diphenyl Ethers (DiBDE)	ND
Tribrominated Diphenyl Ethers (TriBDE)	ND
Tetrabrominated Diphenyl Ethers (TetraBDE)	ND
Pentabrominated Diphenyl Ethers (PentaBDE)	ND
Hexabrominated Diphenyl Ethers (HexaBDE)	ND
Heptabrominated Diphenyl Ethers (HeptaBDE)	ND
Octabrominated Diphenyl Ethers (OctaBDE)	ND
Nonabrominated Diphenyl Ethers (NonaBDE)	ND
Decabrominated Diphenyl Ether (DecaBDE)	ND

# (III) Test Method:

(III) Test Method.		
Testing Item T	esting Method R	eporting Limit
Cadmium (Cd) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Lead (Pb) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Mercury (Hg) content	With reference to IEC 62321 edition 1.0:2008 in clause 7, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Chromium VI (Cr <sup>6+</sup> ) content	With reference to IEC 62321 edition 1.0:2008 in annex C, by alkaline digestion and determined by UV-Vis spectrophotometer.	1 ppm
Polybrominated Biphenyls (PBBs)	With reference to IEC 62321 edition 1.0:2008 in annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
Polybrominated Diphenyl Ethers (PBDEs)	With reference to IEC 62321 edition 1.0:2008 in annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm

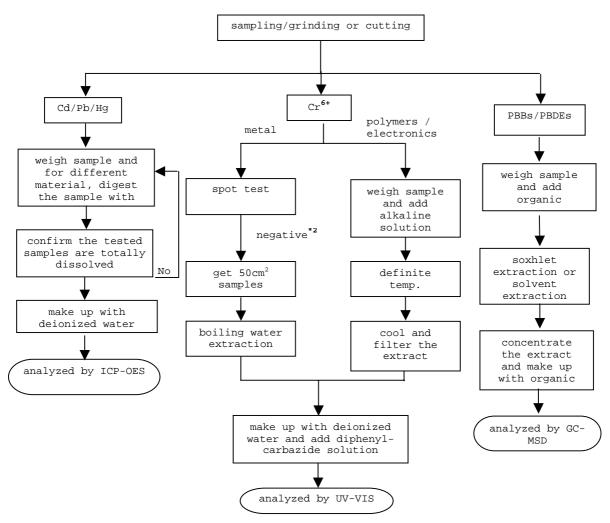
Remark: Reporting limit = Quantitation limit of analyte in sample



#### **TESTS CONDUCTED**

(IV) Measurement Flowchart:

Test For Cd/Pb/Hg/Chromium (VI)/PBBs/PBDEs Contents Reference Standard: IEC 62321 edition 1.0:2008



## **REMARKS:**

\*1: List of appropriate acid

i. List of appropriate acid:	
<u>Material</u>	Acid added for digestion
Polymers	HNO <sub>3</sub> ,HCl,HF,H <sub>2</sub> O <sub>2</sub> ,H <sub>3</sub> BO <sub>3</sub>
Metals HNO	<sub>3,</sub> HCl,HF
Electronics H	$NO_3$ , $HCI$ , $H_2O_2$ , $HBF_4$

\*2: If the result of spot test is positive, Chromium VI would be determined as detected.



# **TESTS CONDUCTED**

# 2 ( I) Test Result Summary:

Testing Item	Result (ppm)
Halogen Content	
Fluorine (F)	ND
Chlorine (CI)	600
Bromine (Br)	ND
lodine (I)	ND

ppm = Parts per million = mg/kg Remarks:

Ν = Not detected D

Responsibility Of Chemist : Leaf Liu

# (III) Test Method:

Testing Item T	esting Method R	eporting Limit
	With reference to EN 14582:2007 by combustion flask with oxygen and determined by ion chromatography	50 ppm

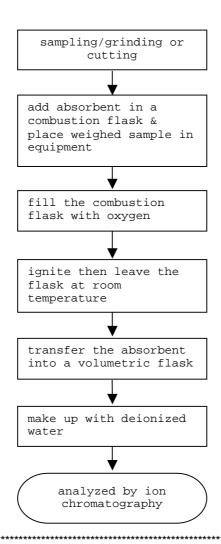
Remark: Reporting limit = Quantitation limit of analyte in sample



## **TESTS CONDUCTED**

(IV) Measurement Flowchart:

Test For Halogen Content Reference Standard: EN 14582



NUMBER: SH

AH00345415



# **TESTS CONDUCTED**

#### 3 (A) TEST RESULT SUMMARY:

TESTING ITEM R	ESULT(ppm)
HBCD (HEXABROMOCYCLODODECANE)	ND

REMARKS:

ppm = PARTS PER MILLION = mg/kg ND = NOT DETECTED

	(R)	<b>TEST</b>	MET	LHUD	
1	(D)	ILOI	IVIC I	טטחו	

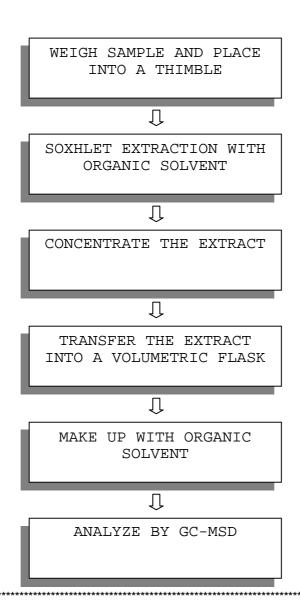
TESTING ITEM T	_ESTING METHOD	REPORTING LIMIT
THRUD (HEXARROMOCYCLODODECANE)	WITH REFERENCE TO USEPA 3540C, BY SOLVENT EXTRACTION AND DETERMINED BY GC/MS	10 ppm



NUMBER: SH AH00345415

## **TESTS CONDUCTED** MEASUREMENT FLOWCHART:

TEST FOR HBCD (HEXABROMOCYCLODODECANE) CONTENT





**TESTS CONDUCTED** 

NUMBER: SH AH00345415

#### 4 PHTHALATE CONTENT TEST

WITH REFERENCE TO EN14372, BY GAS CHROMATOGRAPHY-MASS SPECTROMETRY (GC-MS) ANALYSIS.

TESTED COMPOUND RESULT	(%,W/W)	LIMIT(%,W/W)
		<u>(MAX.)</u>
DIBUTYL PHTHALATE (DBP)	ND	
DI(2-ETHYL HEXYL) PHTHALATE(DEHP)	ND	
BENZYL BUTYL PHTHALATE (BBP)	ND	
SUM OF THREE PHTHALATES '	ND	0.1

REMARK: THE ABOVE LIMIT WAS QUOTED ACCORDING TO ANNEX XVII ITEMS 51 & 52 OF THE REACH

REGULATION (EC) NO. 1907/2006 & AMENDENT NO.552/2009 FOR PHTHALATE CONTENT IN TOYS

AND CHILDREN CARE ARTICLES.

DETECTION LIMIT = 0.01%(W/W)

ND = NOT DETECTED

#### 5 PHTHALATE CONTENT TEST

WITH REFERENCE TO CPSC-CH-C1001-09.3, BY GAS CHROMATOGRAPHY-MASS SPECTROMETRY (GC-MS) ANALYSIS.

TESTED COMPOUND RESULT	(%,W/W)	LIMIT(%,W/W)
		(MAX.)
DI-BUTYL PHTHALATE (DBP)	ND	0.1
DI(2-ETHYL HEXYL) PHTHALATE(DEHP)	ND	0.1
BENZYL BUTYL PHTHALATE (BBP)	ND	0.1

REMARK: THE ABOVE LIMIT WAS QUOTED ACCORDING TO US CONSUMER PRODUCT SAFETY

IMPROVEMENT ACT 2008 FOR PROHIBITION ON SALE OF CERTAIN PRODUCTS CONTAINING

SPECIFIED PHTHALATES.

DETECTION LIMIT = 0.01%(W/W)

ND = NOT DETECTED

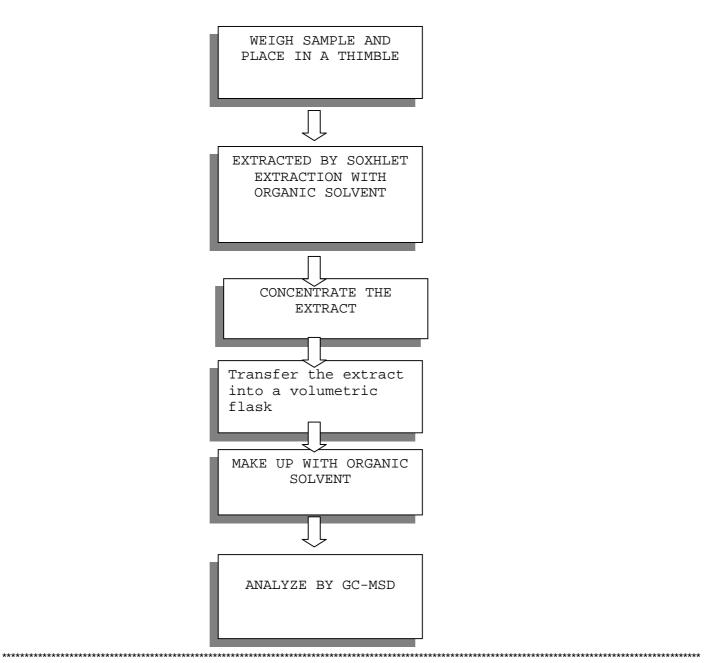


MEASUREMENT FLOWCHART:

# **TEST REPORT**

**TESTS CONDUCTED** 

TEST FOR PHTHALATES CONTENTS (EN14372)



NUMBER: SH

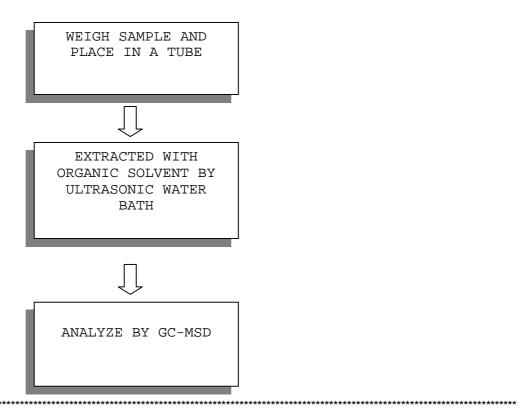
AH00345415



NUMBER: SH AH00345415

## **TESTS CONDUCTED** MEASUREMENT FLOWCHART:

TEST FOR PHTHALATES CONTENTS (CPSC-CH-C1001-09.3)





NUMBER: SH AH00345415

**TESTS CONDUCTED** 



**END OF REPORT** 

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DATE:

OCT 29, 2012

APPLICANT: LITTELFUSE, INC.

800 E. NORTHWEST HWY ΑT A.DIVIETRO/D.UNTIEDT

SAMPLE DESCRIPTION:

ONE (1) SUBMITTED SAMPLE SAID TO BE **BROWN INK.** PART DESCRIPTION INK-BROWN. PART NUMBER 425906.

DATE SAMPLE RECEIVED OCTOBER.15, 2012. DATE TEST STARTED OCTOBER.15, 2012.

TESTS CONDUCTED:

AS REQUESTED BY THE APPLICANT, FOR DETAILS REFER TO ATTACHED PAGE(S)

TO BE CONTINUED

**AUTHORIZED BY:** FOR INTERTEK TESTING SERVICES LTD., SHANGHAI

JACOB LIN

**GENERAL MANAGER** 



# **TESTS CONDUCTED**

## 1 ( I) Test Result Summary:

<u>Testing Item</u>	Result (ppm)
Heavy Metal	
Cadmium (Cd) content	ND
Lead (Pb) content	ND
Mercury (Hg) content	ND
Chromium VI (Cr <sup>6+</sup> ) content	ND
Polybrominated Biphenyls (PBBs)	
Monobrominated Biphenyls (MonoBB)	ND
Dibrominated Biphenyls (DiBB)	ND
Tribrominated Biphenyls (TriBB)	ND
Tetrabrominated Biphenyls (TetraBB)	ND
Pentabrominated Biphenyls (PentaBB)	ND
Hexabrominated Biphenyls (HexaBB)	ND
Heptabrominated Biphenyls (HeptaBB)	ND
Octabrominated Biphenyls (OctaBB)	ND
Nonabrominated Biphenyls (NonaBB)	ND
Decabrominated Biphenyl (DecaBB)	ND
Polybrominated Diphenyl Ethers (PBDEs)	
Monobrominated Diphenyl Ethers (MonoBDE)	ND
Dibrominated Diphenyl Ethers (DiBDE)	ND
Tribrominated Diphenyl Ethers (TriBDE)	ND
Tetrabrominated Diphenyl Ethers (TetraBDE)	ND
Pentabrominated Diphenyl Ethers (PentaBDE)	ND
Hexabrominated Diphenyl Ethers (HexaBDE)	ND
Heptabrominated Diphenyl Ethers (HeptaBDE)	ND
Octabrominated Diphenyl Ethers (OctaBDE)	ND
Nonabrominated Diphenyl Ethers (NonaBDE)	ND
Decabrominated Diphenyl Ether (DecaBDE)	ND

#### (III) Test Method:

(III) Test Metriod.		
Testing Item T	<u>esting Method</u> R	<u>eporting Limit</u>
Cadmium (Cd) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Lead (Pb) content	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Mercury (Hg) content	With reference to IEC 62321 edition 1.0:2008 in clause 7, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
Chromium VI (Cr <sup>6+</sup> ) content	With reference to IEC 62321 edition 1.0:2008 in annex C, by alkaline digestion and determined by UV-Vis spectrophotometer.	1 ppm
Polybrominated Biphenyls (PBBs)	With reference to IEC 62321 edition 1.0:2008 in annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
Polybrominated Diphenyl Ethers (PBDEs)	With reference to IEC 62321 edition 1.0:2008 in annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm

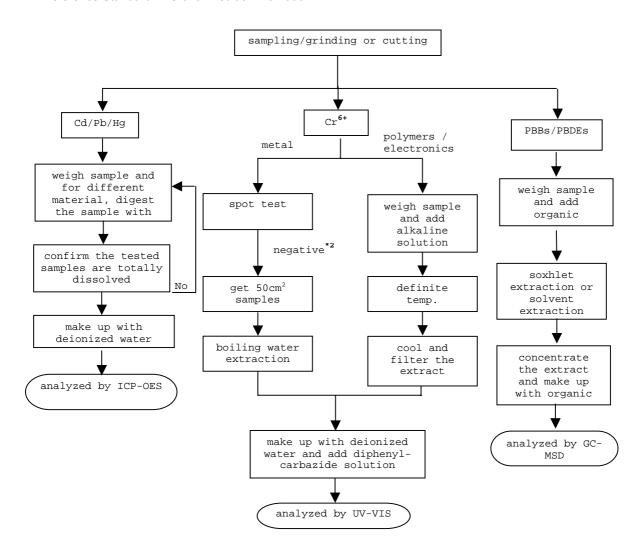
Reporting limit = Quantitation limit of analyte in sample Remark:



#### **TESTS CONDUCTED**

(IV) Measurement Flowchart:

Test For Cd/Pb/Hg/Chromium (VI)/PBBs/PBDEs Contents Reference Standard: IEC 62321 edition 1.0:2008



#### **REMARKS:**

\*1: List of appropriate acid:

<u>Material</u>	Acid added for digestion
Polymers	HNO <sub>3,</sub> HCl,HF,H <sub>2</sub> O <sub>2,</sub> H <sub>3</sub> BO <sub>3</sub>
Metals HNO	<sub>3,</sub> HCl,HF
Electronics H	NO <sub>3,</sub> HCl,H <sub>2</sub> O <sub>2,</sub> HBF <sub>4</sub>

\*2: If the result of spot test is positive, Chromium VI would be determined as detected.



# **TESTS CONDUCTED**

#### 2 ( I) Test Result Summary:

	Testing Item	Result (ppm)
Halogen Content		1
Fluorine (F)		ND
Chlorine (CI)		8600
Bromine (Br)		ND
lodine (I)		ND

Remarks: ppm = Parts per million = mg/kg

Ν D = Not detected

Responsibility Of Chemist : Leaf Liu

(III) Test Method:

Testing Item T	esting Method R	eporting Limit
Halagan Contant	With reference to EN 14582:2007 by combustion flask with	50 nnm
Halogen Content	oxygen and determined by ion chromatography	50 ppm

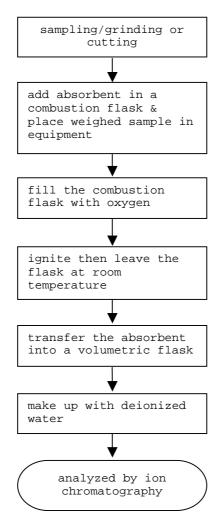
Reporting limit = Quantitation limit of analyte in sample Remark:



**TESTS CONDUCTED** 

( ${\rm IV}$ ) Measurement Flowchart:

Test For Halogen Content Reference Standard: EN 14582



NUMBER: SH

AH00345432



### **TESTS CONDUCTED**

#### 3 (A) TEST RESULT SUMMARY:

TESTING ITEM R	ESULT(ppm)
HBCD (HEXABROMOCYCLODODECANE)	ND

**REMARKS:** 

ppm = PARTS PER MILLION = mg/kg ND = NOT DETECTED

### (B) TEST METHOD:

TESTING ITEM T	ESTING METHOD	REPORTING LIMIT	
HBCD (HEXABROMOCYCLODODECANE)	WITH REFERENCE TO USEPA 3540C, BY SOLVENT EXTRACTION AND DETERMINED BY GC/MS	10 ppm	



NUMBER: SH AH00345432

**TESTS CONDUCTED** 

MEASUREMENT FLOWCHART:

TEST FOR HBCD (HEXABROMOCYCLODODECANE) CONTENT

WEIGH SAMPLE AND PLACE INTO A THIMBLE IJ SOXHLET EXTRACTION WITH ORGANIC SOLVENT CONCENTRATE THE EXTRACT TRANSFER THE EXTRACT INTO A VOLUMETRIC FLASK IJ MAKE UP WITH ORGANIC SOLVENT IJ ANALYZE BY GC-MSD



#### **TESTS CONDUCTED**

#### 4 PHTHALATE CONTENT TEST

WITH REFERENCE TO EN14372, BY GAS CHROMATOGRAPHY-MASS SPECTROMETRY (GC-MS) ANALYSIS.

TESTED COMPOUND RESULT	(%,W/W)	LIMIT(%,W/W)
		(MAX.)
DIBUTYL PHTHALATE (DBP)	ND	
DI(2-ETHYL HEXYL) PHTHALATE(DEHP)	ND	
BENZYL BUTYL PHTHALATE (BBP)	ND	
SUM OF THREE PHTHALATES	ND	0.1

REMARK: THE ABOVE LIMIT WAS QUOTED ACCORDING TO ANNEX XVII ITEMS 51 & 52 OF THE REACH

REGULATION (EC) NO. 1907/2006 & AMENDENT NO.552/2009 (FORMERLY KNOWN AS

DIRECTIVE 2005/84/EC) FOR PHTHALATE CONTENT IN TOYS AND CHILDREN CARE ARTICLES.

DETECTION LIMIT = 0.01%(W/W)

ND = NOT DETECTED

#### 5 PHTHALATE CONTENT TEST

WITH REFERENCE TO CPSC-CH-C1001-09.3, BY GAS CHROMATOGRAPHY-MASS SPECTROMETRY (GC-MS) ANALYSIS.

TESTED COMPOUND RESULT	(%,W/W)	<u>LIMIT(%,W/W)</u>
		(MAX.)
DI-BUTYL PHTHALATE (DBP)	ND	0.1
DI(2-ETHYL HEXYL) PHTHALATE(DEHP)	ND	0.1
BENZYL BUTYL PHTHALATE (BBP)	ND	0.1

REMARK: THE ABOVE LIMIT WAS QUOTED ACCORDING TO US CONSUMER PRODUCT SAFETY

IMPROVEMENT ACT 2008 FOR PROHIBITION ON SALE OF CERTAIN PRODUCTS CONTAINING

SPECIFIED PHTHALATES.

DETECTION LIMIT = 0.01%(W/W)

ND = NOT DETECTED

DATE SAMPLE RECEIVED: OCT.15, 2012

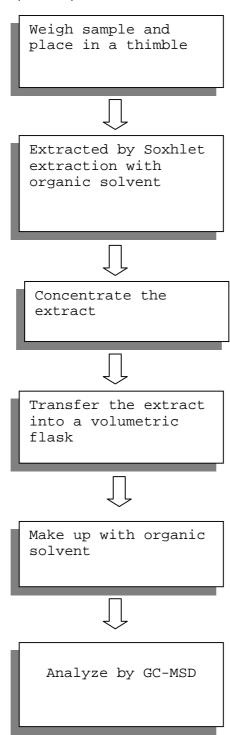
TESTING PERIOD: OCT.15, 2012 TO OCT.23, 2012



NUMBER: SH AH00345432

#### **TESTS CONDUCTED** MEASUREMENT FLOWCHART:

TEST FOR PHTHALATES CONTENTS (EN14372)

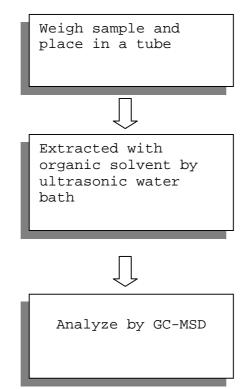




NUMBER: SH AH00345432

#### **TESTS CONDUCTED** MEASUREMENT FLOWCHART:

TEST FOR PHTHALATES CONTENTS (CPSC-CH-C1001-09.3)





**TESTS CONDUCTED** 



END OF REPORT

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DATE:

OCT 29, 2012

APPLICANT: LITTELFUSE, INC.

800 E. NORTHWEST HWY A.DIVIETRO/D.UNTIEDT

ATT

SAMPLE DESCRIPTION:

ONE (1) SUBMITTED SAMPLE SAID TO BE **GREEN INK.** PART DESCRIPTION INK-GREEN. PART NUMBER 425907.

DATE SAMPLE RECEIVED OCTOBER.15, 2012. DATE TEST STARTED OCTOBER.15, 2012.

**TESTS CONDUCTED:** 

AS REQUESTED BY THE APPLICANT, FOR DETAILS REFER TO ATTACHED PAGE(S)

TO BE CONTINUED

**AUTHORIZED BY:** FOR INTERTEK TESTING SERVICES LTD., SHANGHAI

JACOB LIN

**GENERAL MANAGER** 



**TESTS CONDUCTED** 

### I) Test Result Summary:

Testing Item	Result (ppm)
Heavy Metal	·
Cadmium (Cd) content	ND
Lead (Pb) content	ND
Mercury (Hg) content	ND
Chromium VI (Cr <sup>6+</sup> ) content	ND
Polybrominated Biphenyls (PBBs)	
Monobrominated Biphenyls (MonoBB)	ND
Dibrominated Biphenyls (DiBB)	ND
Tribrominated Biphenyls (TriBB)	ND
Tetrabrominated Biphenyls (TetraBB)	ND
Pentabrominated Biphenyls (PentaBB)	ND
Hexabrominated Biphenyls (HexaBB)	ND
Heptabrominated Biphenyls (HeptaBB)	ND
Octabrominated Biphenyls (OctaBB)	ND
Nonabrominated Biphenyls (NonaBB)	ND
Decabrominated Biphenyl (DecaBB)	ND
Polybrominated Diphenyl Ethers (PBDEs)	·
Monobrominated Diphenyl Ethers (MonoBDE)	ND
Dibrominated Diphenyl Ethers (DiBDE)	ND
Tribrominated Diphenyl Ethers (TriBDE)	ND
Tetrabrominated Diphenyl Ethers (TetraBDE)	ND
Pentabrominated Diphenyl Ethers (PentaBDE)	ND
Hexabrominated Diphenyl Ethers (HexaBDE)	ND
Heptabrominated Diphenyl Ethers (HeptaBDE)	ND
Octabrominated Diphenyl Ethers (OctaBDE)	ND
Nonabrominated Diphenyl Ethers (NonaBDE)	ND
Decabrominated Diphenyl Ether (DecaBDE)	ND

NUMBER: SH

AH00345639

## (III) Test Method:

esting Method R	eporting Limit
With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
With reference to IEC 62321 edition 1.0:2008 in clause 7, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
With reference to IEC 62321 edition 1.0:2008 in annex C, by alkaline digestion and determined by UV-Vis spectrophotometer.	1 ppm
With reference to IEC 62321 edition 1.0:2008 in annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
With reference to IEC 62321 edition 1.0:2008 in annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.  With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.  With reference to IEC 62321 edition 1.0:2008 in clause 7, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.  With reference to IEC 62321 edition 1.0:2008 in annex C, by alkaline digestion and determined by UV-Vis spectrophotometer.  With reference to IEC 62321 edition 1.0:2008 in annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.  With reference to IEC 62321 edition 1.0:2008 in annex A, by solvent extraction and determined by GC-MSD and further

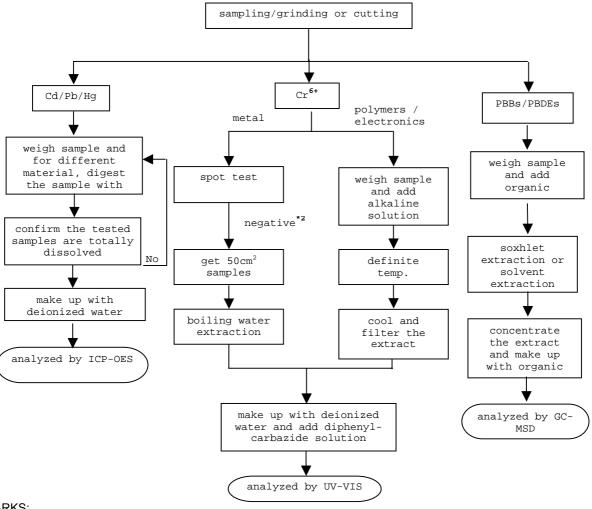
Remark: Reporting limit = Quantitation limit of analyte in sample



#### **TESTS CONDUCTED**

#### (IV) Measurement Flowchart:

Test For Cd/Pb/Hg/Chromium (VI)/PBBs/PBDEs Contents Reference Standard: IEC 62321 edition 1.0:2008



#### REMARKS:

\*1: List of appropriate acid:

i. List of appropriate acid:	
<u>Material</u>	Acid added for digestion
Polymers	HNO <sub>3</sub> ,HCl,HF,H <sub>2</sub> O <sub>2</sub> ,H <sub>3</sub> BO <sub>3</sub>
Metals HNO	3,HCI,HF
Electronics H	NO <sub>3</sub> ,HCl,H <sub>2</sub> O <sub>2</sub> ,HBF <sub>4</sub>

\*2: If the result of spot test is positive, Chromium VI would be determined as detected.



### **TESTS CONDUCTED**

#### 2 (I) Test Result Summary:

	Testing Item	Result (ppm)
Halogen Content		
Fluorine (F)		200
Chlorine (CI)		650
Bromine (Br)		ND
lodine (I)		ND

ppm = Parts per million = mg/kg Remarks:

ND = Not detected

Responsibility Of Chemist : Leaf Liu

(III) Test Method:

Testing Item T	esting Method R	eporting Limit
imalogen Content	With reference to EN 14582:2007 by combustion flask with oxygen and determined by ion chromatography	50 ppm

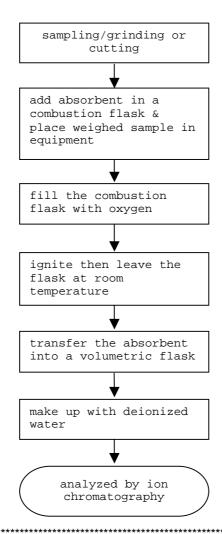
Remark: Reporting limit = Quantitation limit of analyte in sample



### **TESTS CONDUCTED**

(IV) Measurement Flowchart:

Test For Halogen Content Reference Standard: EN 14582



NUMBER: SH

AH00345639



**TESTS CONDUCTED** 

#### 3 (A) TEST RESULT SUMMARY:

TESTING ITEM R	ESULT(ppm)
HBCD (HEXABROMOCYCLODODECANE)	ND

NUMBER: SH

AH00345639

**REMARKS:** 

ppm = PARTS PER MILLION = mg/kg ND = NOT DETECTED

#### (B) TEST METHOD:

TESTING ITEM TE	STING METHOD	REPORTING LIMIT
HBCD (HEXABROMOCYCLODODECANE)	WITH REFERENCE TO USEPA 3540C, BY SOLVENT EXTRACTION AND DETERMINED BY GC/MS	10 ppm



NUMBER: SH AH00345639

**TESTS CONDUCTED** 

### **MEASUREMENT FLOWCHART:**

TEST FOR HBCD (HEXABROMOCYCLODODECANE) CONTENT

WEIGH SAMPLE AND PLACE INTO A THIMBLE IJ SOXHLET EXTRACTION WITH ORGANIC SOLVENT CONCENTRATE THE EXTRACT TRANSFER THE EXTRACT INTO A VOLUMETRIC FLASK IJ MAKE UP WITH ORGANIC SOLVENT IJ ANALYZE BY GC-MSD



#### **TESTS CONDUCTED**

# 4 PHT HALATE CONTENT TEST

WITH REFERENCE TO EN14372, BY GAS CHROMATOGRAPHY-MASS SPECTROMETRY (GC-MS) ANALYSIS.

TESTED COMPOUND R	<u>ESULT (%,W/W)</u>	LIMIT(%,W/W)
		(MAX.)
DIBUTYL PHTHALATE (DBP)	ND	
DI(2-ETHYL HEXYL) PHTHALATE(DEHP)	ND	
BENZYL BUTYL PHTHALATE (BBP)	ND	
SUM OF THREE PHTHALATES	ND	0.1

REMARK: THE ABOVE LIMIT WAS QUOTED ACCORDING TO ANNEX XVII ITEMS 51 & 52 OF THE REACH

REGULATION (EC) NO. 1907/2006 & AMENDENT NO.552/2009 FOR PHTHALATE CONTENT IN TOYS

AND CHILDREN CARE ARTICLES.

DETECTION LIMIT = 0.01%(W/W)

ND = NOT DETECTED

#### 5 PHT HALATE CONTENT TEST

WITH REFERENCE TO CPSC-CH-C1001-09.3, BY GAS CHROMATOGRAPHY-MASS SPECTROMETRY (GC-MS) ANALYSIS.

TESTED COMPOUND R	ESULT (%,W/W)	LIMIT(%,W/W)
		<u>(MAX.)</u>
DI-BUTYL PHTHALATE (DBP)	ND	0.1
DI(2-ETHYL HEXYL) PHTHALATE(DEHP)	ND	0.1
BENZYL BUTYL PHTHALATE (BBP)	ND	0.1

REMARK: THE ABOVE LIMIT WAS QUOTED ACCORDING TO US CONSUMER PRODUCT SAFETY

IMPROVEMENT ACT 2008 & AMENDMENT H.R.2715 FOR PROHIBITION ON SALE OF CERTAIN

PRODUCTS CONTAINING SPECIFIED PHTHALATES.

DETECTION LIMIT = 0.01%(W/W)

ND = NOT DETECTED

DATE SAMPLE RECEIVED: OCT.15, 2012

TESTING PERIOD: OCT.15, 2012 TO OCT.18, 2012

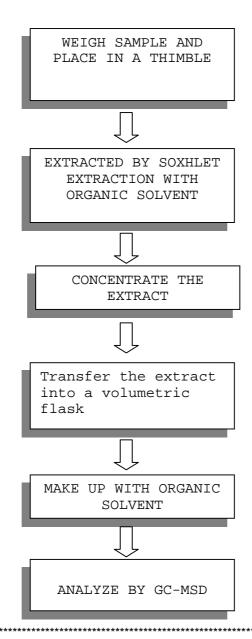


NUMBER: SH AH00345639

**TESTS CONDUCTED** 

MEASUREMENT FLOWCHART:

TEST FOR PHTHALATES CONTENTS (EN14372)



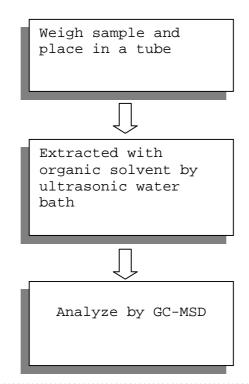


NUMBER: SH AH00345639

**TESTS CONDUCTED** 

MEASUREMENT FLOWCHART:

TEST FOR PHTHALATES CONTENTS (CPSC-CH-C1001-09.3)





**TESTS CONDUCTED** 

NUMBER: SH AH00345639



**END OF REPORT** 

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DATE:

OCT 26, 2012

APPLICANT: LITTELFUSE, INC.

800 E. NORTHWEST HWY

ΑT A.DIVIETRO/D.UNTIEDT

SAMPLE DESCRIPTION:

ONE (1) SUBMITTED SAMPLE SAID TO BE: GREY INK. PART DESCRIPTION INK-GREY. PART NUMBER 425909.

DATE SAMPLE RECEIVED OCTOBER.15, 2012. DATE TEST STARTED OCTOBER.15, 2012.

**TESTS CONDUCTED:** 

AS REQUESTED BY THE APPLICANT, FOR DETAILS REFER TO ATTACHED PAGE(S)

TO BE CONTINUED

**AUTHORIZED BY:** FOR INTERTEK TESTING SERVICES LTD., SHANGHAI

JACOB LIN

**GENERAL MANAGER** 



### **TESTS CONDUCTED**

### 1 ( I ) Test Result Summary :

<u>Testing Item</u>	Result (ppm)
Heavy Metal	
Cadmium (Cd) content	ND
Lead (Pb) content	ND
Mercury (Hg) content	ND
Chromium VI (Cr <sup>6+</sup> ) content	ND
Polybrominated Biphenyls (PBBs)	
Monobrominated Biphenyls (MonoBB)	ND
Dibrominated Biphenyls (DiBB)	ND
Tribrominated Biphenyls (TriBB)	ND
Tetrabrominated Biphenyls (TetraBB)	ND
Pentabrominated Biphenyls (PentaBB)	ND
Hexabrominated Biphenyls (HexaBB)	ND
Heptabrominated Biphenyls (HeptaBB)	ND
Octabrominated Biphenyls (OctaBB)	ND
Nonabrominated Biphenyls (NonaBB)	ND
Decabrominated Biphenyl (DecaBB)	ND
Polybrominated Diphenyl Ethers (PBDEs)	
Monobrominated Diphenyl Ethers (MonoBDE)	ND
Dibrominated Diphenyl Ethers (DiBDE)	ND
Tribrominated Diphenyl Ethers (TriBDE)	ND
Tetrabrominated Diphenyl Ethers (TetraBDE)	ND
Pentabrominated Diphenyl Ethers (PentaBDE)	ND
Hexabrominated Diphenyl Ethers (HexaBDE)	ND
Heptabrominated Diphenyl Ethers (HeptaBDE)	ND
Octabrominated Diphenyl Ethers (OctaBDE)	ND
Nonabrominated Diphenyl Ethers (NonaBDE)	ND
Decabrominated Diphenyl Ether (DecaBDE)	ND

## (III) Test Method:

esting Method R	eporting Limit
With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
With reference to IEC 62321 edition 1.0:2008 in clause 7, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
With reference to IEC 62321 edition 1.0:2008 in annex C, by alkaline digestion and determined by UV-Vis spectrophotometer.	1 ppm
With reference to IEC 62321 edition 1.0:2008 in annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
With reference to IEC 62321 edition 1.0:2008 in annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.  With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.  With reference to IEC 62321 edition 1.0:2008 in clause 7, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.  With reference to IEC 62321 edition 1.0:2008 in annex C, by alkaline digestion and determined by UV-Vis spectrophotometer. With reference to IEC 62321 edition 1.0:2008 in annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.  With reference to IEC 62321 edition 1.0:2008 in annex A, by solvent extraction and determined by GC-MSD and further

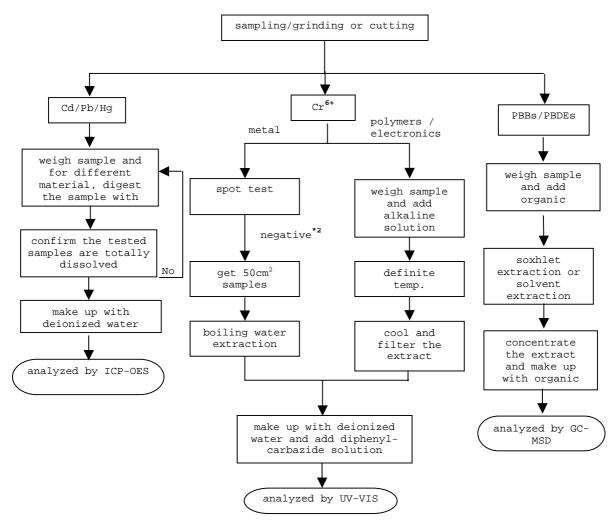
Remark: Reporting limit = Quantitation limit of analyte in sample



#### **TESTS CONDUCTED**

(IV) Measurement Flowchart:

Test For Cd/Pb/Hg/Chromium (VI)/PBBs/PBDEs Contents Reference Standard: IEC 62321 edition 1.0:2008



#### **REMARKS:**

\*1: List of appropriate acid:

i. List of appropriate acid:	
<u>Material</u>	Acid added for digestion
Polymers	HNO <sub>3</sub> ,HCl,HF,H <sub>2</sub> O <sub>2</sub> ,H <sub>3</sub> BO <sub>3</sub>
Metals HNO	<sub>3,</sub> HCl,HF
Electronics H	NO <sub>3.</sub> HCI,H <sub>2</sub> O <sub>2.</sub> HBF <sub>4</sub>

\*2: If the result of spot test is positive, Chromium VI would be determined as detected.



### **TESTS CONDUCTED**

### 2 ( I) Test Result Summary:

Testing Item	Result (ppm)
Halogen Content	
Fluorine (F)	ND
Chlorine (CI)	ND
Bromine (Br)	ND
lodine (I)	ND

ppm = Parts per million based on weight of tested sample = mg/kg Remarks:

Ν = Not detected D

Responsibility Of Chemist : Ken He

### (III) Test Method:

Testing Item T	esting Method R	eporting Limit
Halagan Contant	With reference to EN 14582:2007 by combustion flask with	50 nnm
Halogen Content	oxygen and determined by ion chromatography	50 ppm

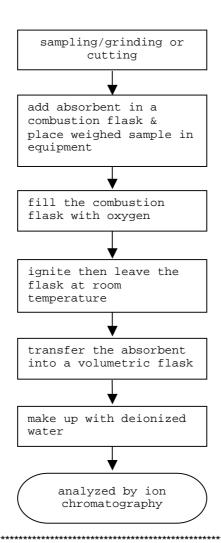
Remark: Reporting limit = Quantitation limit of analyte in sample



#### **TESTS CONDUCTED**

(IV) Measurement Flowchart:

Test For Halogen Content Reference Standard: EN 14582



NUMBER: SH

AH00345659



NUMBER: SH AH00345659

# 3 (A) TEST RESULT SUMMARY:

**TESTS CONDUCTED** 

TESTING ITEM R	ESULT(ppm)
HBCD (HEXABROMOCYCLODODECANE)	ND

REMARKS:

ppm = PARTS PER MILLION = mg/kg ND = NOT DETECTED

(B) TEST METHOD:

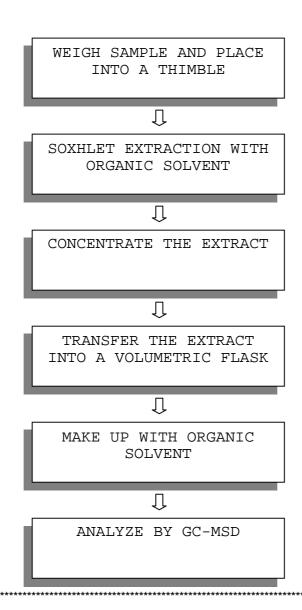
	TESTING ITEM T	_ESTING METHOD	REPORTING LIMIT
HBCD (HE)	(ABROMOCYCLODODECANE)	WITH REFERENCE TO USEPA 3540C, BY SOLVENT EXTRACTION AND DETERMINED BY GC/MS	10 ppm



NUMBER: SH AH00345659

#### **TESTS CONDUCTED** MEASUREMENT FLOWCHART:

TEST FOR HBCD (HEXABROMOCYCLODODECANE) CONTENT





#### ILST KLI ON

**TESTS CONDUCTED** 

#### 4 PHTHALATE CONTENT TEST

WITH REFERENCE TO EN14372, BY GAS CHROMATOGRAPHY-MASS SPECTROMETRY (GC-MS) ANALYSIS.

TESTED COMPOUND RESULT	(%,W/W)	LIMIT(%,W/W)
		(MAX.)
DIBUTYL PHTHALATE (DBP)	ND	
DI(2-ETHYL HEXYL) PHTHALATE(DEHP)	ND	
BENZYL BUTYL PHTHALATE (BBP)	ND	
SUM OF THREE PHTHALATES	ND	0.1

REMARK: THE ABOVE LIMIT WAS QUOTED ACCORDING TO ANNEX XVII ITEMS 51 & 52 OF THE REACH

REGULATION (EC) NO. 1907/2006 & AMENDENT NO.552/2009 FOR PHTHALATE CONTENT IN TOYS

NUMBER: SH AH00345659

AND CHILDREN CARE ARTICLES.

DETECTION LIMIT = 0.01%(W/W)

ND = NOT DETECTED

#### 5 PHTHALATE CONTENT TEST

WITH REFERENCE TO CPSC-CH-C1001-09.3, BY GAS CHROMATOGRAPHY-MASS SPECTROMETRY (GC-MS) ANALYSIS.

TESTED COMPOUND RESULT	(%,W/W)	<u>LIMIT(%,W/W)</u>
		(MAX.)
DI-BUTYL PHTHALATE (DBP)	ND	0.1
DI(2-ETHYL HEXYL) PHTHALATE(DEHP)	ND	0.1
BENZYL BUTYL PHTHALATE (BBP)	ND	0.1

REMARK: THE ABOVE LIMIT WAS QUOTED ACCORDING TO US CONSUMER PRODUCT SAFETY

IMPROVEMENT ACT 2008 FOR PROHIBITION ON SALE OF CERTAIN PRODUCTS CONTAINING

SPECIFIED PHTHALATES.

DETECTION LIMIT = 0.01%(W/W)

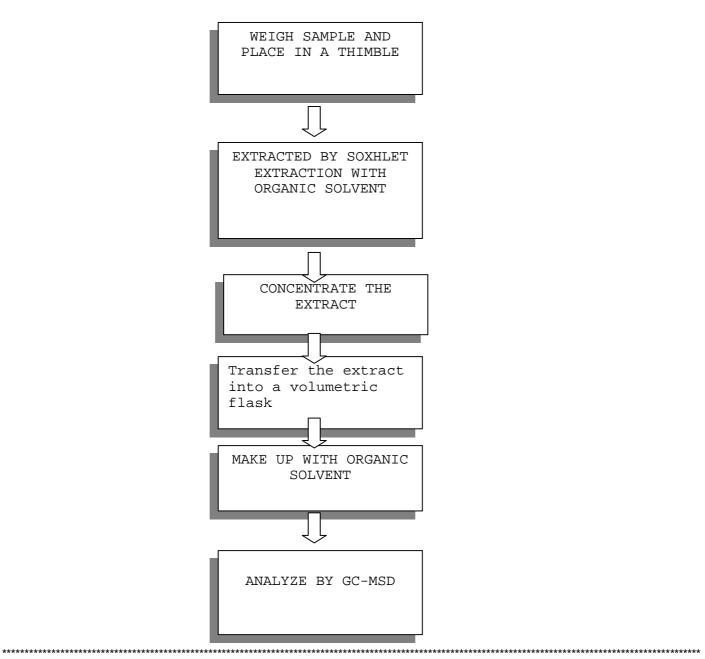
ND = NOT DETECTED



NUMBER: SH AH00345659

**TESTS CONDUCTED** MEASUREMENT FLOWCHART:

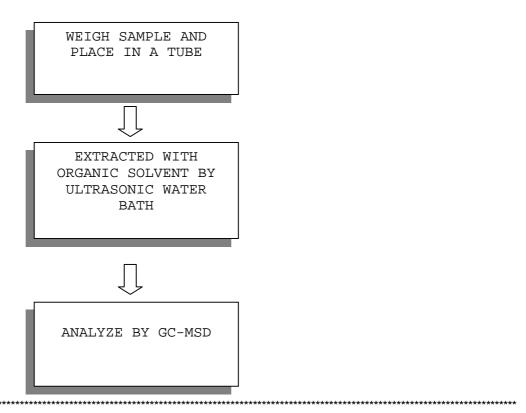
TEST FOR PHTHALATES CONTENTS (EN14372)





**TESTS CONDUCTED** MEASUREMENT FLOWCHART:

TEST FOR PHTHALATES CONTENTS (CPSC-CH-C1001-09.3)



NUMBER: SH

AH00345659



**TESTS CONDUCTED** 



**END OF REPORT** 

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APPLICANT: LITTELFUSE,INC. DATE: OCT 29, 2012

800 E. NORTHWEST HWY

A.DIVIETRO/D.UNTIEDT ATT

SAMPLE DESCRIPTION:

ONE (1) SUBMITTED SAMPLE SAID TO BE VIOLET INK. PART DESCRIPTION INK-VIOLET. PART NUMBER 425911.

DATE SAMPLE RECEIVED OCTOBER.15, 2012. DATE TEST STARTED OCTOBER.15, 2012.

TESTS CONDUCTED:

AS REQUESTED BY THE APPLICANT, FOR DETAILS REFER TO ATTACHED PAGE(S)

TO BE CONTINUED

**AUTHORIZED BY:** FOR INTERTEK TESTING SERVICES LTD., SHANGHAI

JACOB LIN

**GENERAL MANAGER** 



**TESTS CONDUCTED** 

### I) Test Result Summary:

Testing Item	Result (ppm)		
leavy Metal			
Cadmium (Cd) content	ND		
Lead (Pb) content	ND		
Mercury (Hg) content	ND		
Chromium VI (Cr <sup>6+</sup> ) content	ND		
Polybrominated Biphenyls (PBBs)			
Monobrominated Biphenyls (MonoBB)	ND		
Dibrominated Biphenyls (DiBB)	ND		
Tribrominated Biphenyls (TriBB)	ND		
Tetrabrominated Biphenyls (TetraBB)	ND		
Pentabrominated Biphenyls (PentaBB)	ND		
Hexabrominated Biphenyls (HexaBB)	ND		
Heptabrominated Biphenyls (HeptaBB)	ND		
Octabrominated Biphenyls (OctaBB)	ND		
Nonabrominated Biphenyls (NonaBB)	ND		
Decabrominated Biphenyl (DecaBB)	ND		
Polybrominated Diphenyl Ethers (PBDEs)	·		
Monobrominated Diphenyl Ethers (MonoBDE)	ND		
Dibrominated Diphenyl Ethers (DiBDE)	ND		
Tribrominated Diphenyl Ethers (TriBDE)	ND		
Tetrabrominated Diphenyl Ethers (TetraBDE)	ND		
Pentabrominated Diphenyl Ethers (PentaBDE)	ND		
Hexabrominated Diphenyl Ethers (HexaBDE)	ND		
Heptabrominated Diphenyl Ethers (HeptaBDE)	ND		
Octabrominated Diphenyl Ethers (OctaBDE)	ND		
Nonabrominated Diphenyl Ethers (NonaBDE)	ND		
Decabrominated Diphenyl Ether (DecaBDE)	ND		

NUMBER: SH

AH00345663

## (III) Test Method:

esting Method R	eporting Limit
With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
With reference to IEC 62321 edition 1.0:2008 in clause 7, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
With reference to IEC 62321 edition 1.0:2008 in annex C, by alkaline digestion and determined by UV-Vis spectrophotometer.	1 ppm
With reference to IEC 62321 edition 1.0:2008 in annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
With reference to IEC 62321 edition 1.0:2008 in annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.  With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.  With reference to IEC 62321 edition 1.0:2008 in clause 7, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.  With reference to IEC 62321 edition 1.0:2008 in annex C, by alkaline digestion and determined by UV-Vis spectrophotometer.  With reference to IEC 62321 edition 1.0:2008 in annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.  With reference to IEC 62321 edition 1.0:2008 in annex A, by solvent extraction and determined by GC-MSD and further

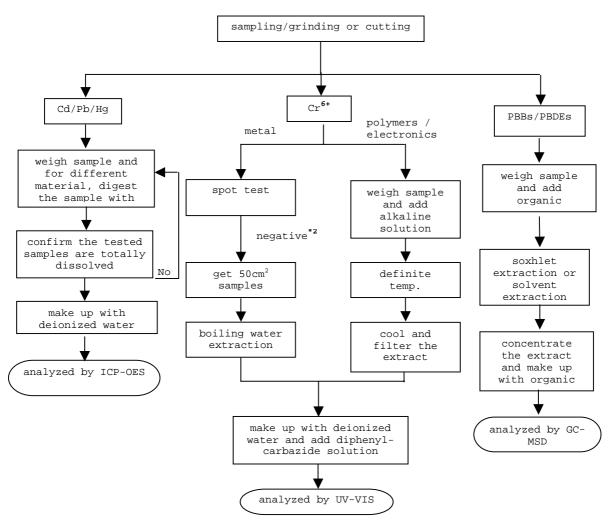
Reporting limit = Quantitation limit of analyte in sample Remark:



#### **TESTS CONDUCTED**

#### (IV) Measurement Flowchart:

Test For Cd/Pb/Hg/Chromium (VI)/PBBs/PBDEs Contents Reference Standard: IEC 62321 edition 1.0:2008



# **REMARKS:**

\*1: List of appropriate acid:

<u>Material</u>	Acid added for digestion
Polymers	HNO <sub>3</sub> ,HCl,HF,H <sub>2</sub> O <sub>2</sub> ,H <sub>3</sub> BO <sub>3</sub>
Metals HNO	<sub>3,</sub> HCl,HF
Electronics H	NO <sub>3,</sub> HCI,H <sub>2</sub> O <sub>2,</sub> HBF <sub>4</sub>

\*2: If the result of spot test is positive, Chromium VI would be determined as detected.



### **TESTS CONDUCTED**

### I) Test Result Summary:

Testing Item	Result (ppm)
Halogen Content	
Fluorine (F)	ND
Chlorine (CI)	6800
Bromine (Br)	ND
lodine (I)	ND

Remarks: ppm = Parts per million = mg/kg

ND = Not detected

Responsibility Of Chemist : Leaf Liu

#### (III) Test Method:

Testing Item T	esting Method R	eporting Limit
IHAIOOEN CONIENT	With reference to EN 14582:2007 by combustion flask with oxygen and determined by ion chromatography	50 ppm

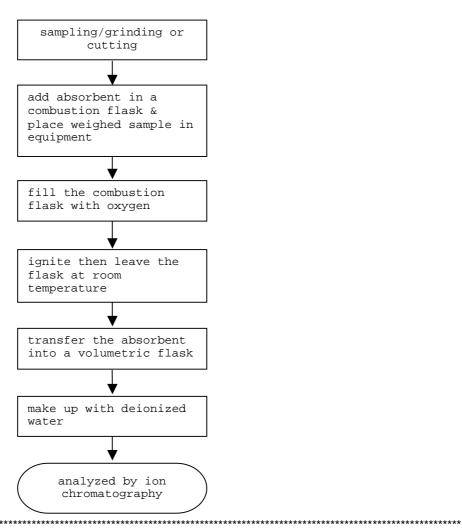
Reporting limit = Quantitation limit of analyte in sample Remark:



**TESTS CONDUCTED** 

(IV) Measurement Flowchart:

Test For Halogen Content Reference Standard: EN 14582



NUMBER: SH

AH00345663



**TESTS CONDUCTED** 

#### 3 (A) TEST RESULT SUMMARY:

TESTING ITEM R	ESULT(ppm)
HBCD (HEXABROMOCYCLODODECANE)	ND

NUMBER: SH

AH00345663

REMARKS:

ppm = PARTS PER MILLION = mg/kg ND = NOT DETECTED

### (B) TEST METHOD:

TESTING ITEM TE	STING METHOD	REPORTING LIMIT
HBCD (HEXABROMOCYCLODODECANE)	WITH REFERENCE TO USEPA 3540C, BY SOLVENT EXTRACTION AND DETERMINED BY GC/MS	10 ppm



NUMBER: SH AH00345663

**TESTS CONDUCTED** 

# MEASUREMENT FLOWCHART:

TEST FOR HBCD (HEXABROMOCYCLODODECANE) CONTENT

WEIGH SAMPLE AND PLACE INTO A THIMBLE IJ SOXHLET EXTRACTION WITH ORGANIC SOLVENT CONCENTRATE THE EXTRACT TRANSFER THE EXTRACT INTO A VOLUMETRIC FLASK IJ MAKE UP WITH ORGANIC SOLVENT IJ ANALYZE BY GC-MSD

TO BE CONTINUED



#### **TESTS CONDUCTED**

### 4 PHT HALATE CONTENT TEST

WITH REFERENCE TO EN14372, BY GAS CHROMATOGRAPHY-MASS SPECTROMETRY (GC-MS) ANALYSIS.

TESTED COMPOUND R	<u>ESULT (%,W/W)</u>	LIMIT(%,W/W)
		<u>(MAX.)</u>
DIBUTYL PHTHALATE (DBP)	ND	
DI(2-ETHYL HEXYL) PHTHALATE(DEHP)	ND	
BENZYL BUTYL PHTHALATE (BBP)	ND	
SUM OF THREE PHTHALATES	ND	0.1

REMARK: THE ABOVE LIMIT WAS QUOTED ACCORDING TO ANNEX XVII ITEMS 51 & 52 OF THE REACH

REGULATION (EC) NO. 1907/2006 & AMENDENT NO.552/2009 FOR PHTHALATE CONTENT IN TOYS

AND CHILDREN CARE ARTICLES.

DETECTION LIMIT = 0.01%(W/W)

ND = NOT DETECTED

#### 5 PHT HALATE CONTENT TEST

WITH REFERENCE TO CPSC-CH-C1001-09.3, BY GAS CHROMATOGRAPHY-MASS SPECTROMETRY (GC-MS) ANALYSIS.

TESTED COMPOUND R	<u>ESULT (%,W/W)</u>	LIMIT(%,W/W)
		(MAX.)
DI-BUTYL PHTHALATE (DBP)	ND	0.1
DI(2-ETHYL HEXYL) PHTHALATE(DEHP)	ND	0.1
BENZYL BUTYL PHTHALATE (BBP)	ND	0.1

REMARK: THE ABOVE LIMIT WAS QUOTED ACCORDING TO US CONSUMER PRODUCT SAFETY

IMPROVEMENT ACT 2008 & AMENDMENT H.R.2715 FOR PROHIBITION ON SALE OF CERTAIN

PRODUCTS CONTAINING SPECIFIED PHTHALATES.

DETECTION LIMIT = 0.01%(W/W)

ND = NOT DETECTED

DATE SAMPLE RECEIVED: OCT.15, 2012

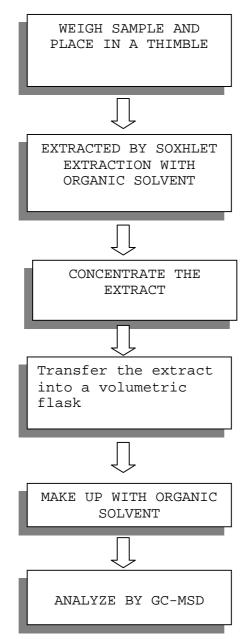
TESTING PERIOD : OCT.15, 2012 TO OCT.23, 2012



**TESTS CONDUCTED** 

#### MEASUREMENT FLOWCHART:

TEST FOR PHTHALATES CONTENTS (EN14372)



TO BE CONTINUED

NUMBER: SH AH00345663

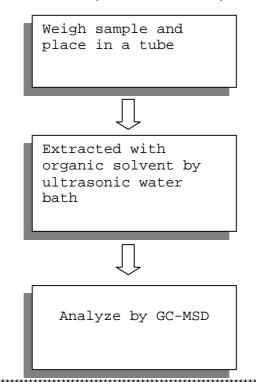


#### **TEST REPORT** NUMBER: SH AH00345663

**TESTS CONDUCTED** 

#### MEASUREMENT FLOWCHART:

TEST FOR PHTHALATES CONTENTS (CPSC-CH-C1001-09.3)





**TESTS CONDUCTED** 

NUMBER: SH AH00345663



**END OF REPORT** 

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**TEST REPORT** NUMBER: SH AH00345657

APPLICANT: LITTELFUSE,INC. DATE: OCT 29, 2012

800 E. NORTHWEST HWY

A.DIVIETRO/D.UNTIEDT ATT

SAMPLE DESCRIPTION:

ONE (1) SUBMITTED SAMPLE SAID TO BE PALE BLUE INK. PART DESCRIPTION INK-PALE BLUE.

PART NUMBER 425913.

DATE SAMPLE RECEIVED OCTOBER.15, 2012. DATE TEST STARTED OCTOBER.15, 2012.

**TESTS CONDUCTED:** 

AS REQUESTED BY THE APPLICANT, FOR DETAILS REFER TO ATTACHED PAGE(S)

TO BE CONTINUED

**AUTHORIZED BY:** FOR INTERTEK TESTING SERVICES LTD., SHANGHAI

JACOB LIN

**GENERAL MANAGER** 



**TESTS CONDUCTED** 

### I) Test Result Summary:

Testing Item	Result (ppm)
Heavy Metal	·
Cadmium (Cd) content	ND
Lead (Pb) content	ND
Mercury (Hg) content	ND
Chromium VI (Cr <sup>6+</sup> ) content	ND
Polybrominated Biphenyls (PBBs)	
Monobrominated Biphenyls (MonoBB)	ND
Dibrominated Biphenyls (DiBB)	ND
Tribrominated Biphenyls (TriBB)	ND
Tetrabrominated Biphenyls (TetraBB)	ND
Pentabrominated Biphenyls (PentaBB)	ND
Hexabrominated Biphenyls (HexaBB)	ND
Heptabrominated Biphenyls (HeptaBB)	ND
Octabrominated Biphenyls (OctaBB)	ND
Nonabrominated Biphenyls (NonaBB)	ND
Decabrominated Biphenyl (DecaBB)	ND
Polybrominated Diphenyl Ethers (PBDEs)	·
Monobrominated Diphenyl Ethers (MonoBDE)	ND
Dibrominated Diphenyl Ethers (DiBDE)	ND
Tribrominated Diphenyl Ethers (TriBDE)	ND
Tetrabrominated Diphenyl Ethers (TetraBDE)	ND
Pentabrominated Diphenyl Ethers (PentaBDE)	ND
Hexabrominated Diphenyl Ethers (HexaBDE)	ND
Heptabrominated Diphenyl Ethers (HeptaBDE)	ND
Octabrominated Diphenyl Ethers (OctaBDE)	ND
Nonabrominated Diphenyl Ethers (NonaBDE)	ND
Decabrominated Diphenyl Ether (DecaBDE)	ND

NUMBER: SH

AH00345657

### (III) Test Method:

esting Method R	eporting Limit
With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
With reference to IEC 62321 edition 1.0:2008 in clause 7, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.	2 ppm
With reference to IEC 62321 edition 1.0:2008 in annex C, by alkaline digestion and determined by UV-Vis spectrophotometer.	1 ppm
With reference to IEC 62321 edition 1.0:2008 in annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
With reference to IEC 62321 edition 1.0:2008 in annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.	5 ppm
	With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.  With reference to IEC 62321 edition 1.0:2008 in clause 8/9/10, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.  With reference to IEC 62321 edition 1.0:2008 in clause 7, by microwave digestion until the tested samples are totally dissolved and determined by ICP-OES.  With reference to IEC 62321 edition 1.0:2008 in annex C, by alkaline digestion and determined by UV-Vis spectrophotometer.  With reference to IEC 62321 edition 1.0:2008 in annex A, by solvent extraction and determined by GC-MSD and further HPLC confirmation when necessary.  With reference to IEC 62321 edition 1.0:2008 in annex A, by solvent extraction and determined by GC-MSD and further

Remark: Reporting limit = Quantitation limit of analyte in sample

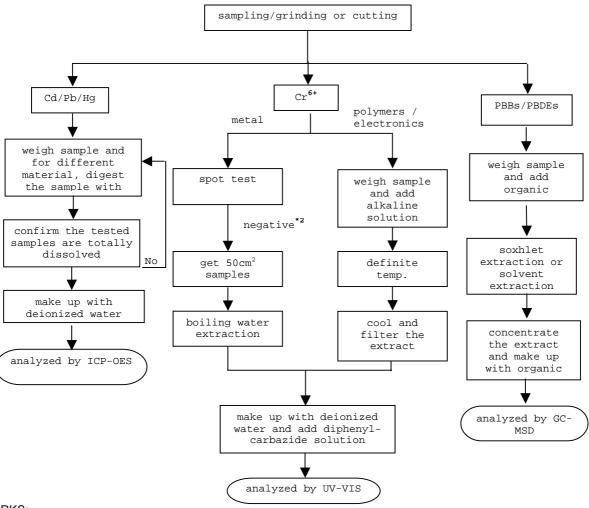


#### TEST REPORT NUMBER: SH AH00345657

#### **TESTS CONDUCTED**

#### (IV) Measurement Flowchart:

Test For Cd/Pb/Hg/Chromium (VI)/PBBs/PBDEs Contents Reference Standard: IEC 62321 edition 1.0:2008



### REMARKS:

\*1: List of appropriate acid:

i. List of appropriate acid:	
<u>Material</u>	Acid added for digestion
Polymers	HNO <sub>3</sub> ,HCl,HF,H <sub>2</sub> O <sub>2</sub> ,H <sub>3</sub> BO <sub>3</sub>
Metals HNO	<sub>3,</sub> HCl,HF
Electronics H	$NO_3$ , $HCI$ , $H_2O_2$ , $HBF_4$

\*2: If the result of spot test is positive, Chromium VI would be determined as detected.



**TEST REPORT** NUMBER: SH AH00345657

### **TESTS CONDUCTED**

### 2 ( I) Test Result Summary:

Testing Item	Result (ppm)
Halogen Content	
Fluorine (F)	ND
Chlorine (CI)	ND
Bromine (Br)	ND
lodine (I)	ND

Remarks: ppm = Parts per million = mg/kg

ND = Not detected

Responsibility Of Chemist : Leaf Liu

(III) Test Method:

Testing Item T	esting Method R	eporting Limit
	With reference to EN 14582:2007 by combustion flask with oxygen and determined by ion chromatography	50 ppm

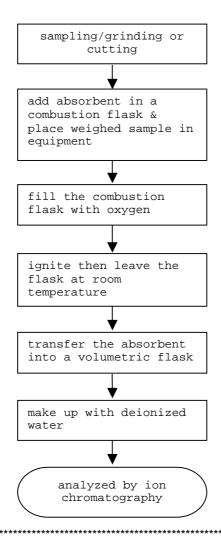
Reporting limit = Quantitation limit of analyte in sample Remark:



### **TESTS CONDUCTED**

(IV) Measurement Flowchart:

Test For Halogen Content Reference Standard: EN 14582



NUMBER: SH

AH00345657



**TESTS CONDUCTED** 

#### 3 (A) TEST RESULT SUMMARY:

TESTING ITEM R	ESULT(ppm)
HBCD (HEXABROMOCYCLODODECANE)	ND

NUMBER: SH

AH00345657

REMARKS:

ppm = PARTS PER MILLION = mg/kg ND = NOT DETECTED

#### (B) TEST METHOD:

TESTING ITEM TE	STING METHOD	REPORTING LIMIT
HBCD (HEXABROMOCYCLODODECANE)	WITH REFERENCE TO USEPA 3540C, BY SOLVENT EXTRACTION AND DETERMINED BY GC/MS	10 ppm



NUMBER: SH AH00345657

#### **TESTS CONDUCTED**

### **MEASUREMENT FLOWCHART:**

TEST FOR HBCD (HEXABROMOCYCLODODECANE) CONTENT

WEIGH SAMPLE AND PLACE INTO A THIMBLE IJ SOXHLET EXTRACTION WITH ORGANIC SOLVENT CONCENTRATE THE EXTRACT TRANSFER THE EXTRACT INTO A VOLUMETRIC FLASK IJ MAKE UP WITH ORGANIC SOLVENT IJ ANALYZE BY GC-MSD



#### TEST REPORT NUMBER: SH AH00345657

#### **TESTS CONDUCTED**

### 4 PHT HALATE CONTENT TEST

WITH REFERENCE TO EN14372, BY GAS CHROMATOGRAPHY-MASS SPECTROMETRY (GC-MS) ANALYSIS.

TESTED COMPOUND R	<u>ESULT (%,W/W)</u>	LIMIT(%,W/W)
		(MAX.)
DIBUTYL PHTHALATE (DBP)	ND	
DI(2-ETHYL HEXYL) PHTHALATE(DEHP)	ND	
BENZYL BUTYL PHTHALATE (BBP)	ND	
SUM OF THREE PHTHALATES	ND	0.1

REMARK: THE ABOVE LIMIT WAS QUOTED ACCORDING TO ANNEX XVII ITEMS 51 & 52 OF THE REACH

REGULATION (EC) NO. 1907/2006 & AMENDENT NO.552/2009 FOR PHTHALATE CONTENT IN TOYS

AND CHILDREN CARE ARTICLES.

DETECTION LIMIT = 0.01%(W/W)

ND = NOT DETECTED

#### 5 PHT HALATE CONTENT TEST

WITH REFERENCE TO CPSC-CH-C1001-09.3, BY GAS CHROMATOGRAPHY-MASS SPECTROMETRY (GC-MS) ANALYSIS.

TESTED COMPOUND R	<u>ESULT (%,W/W)</u>	LIMIT(%,W/W)
		(MAX.)
DI-BUTYL PHTHALATE (DBP)	ND	0.1
DI(2-ETHYL HEXYL) PHTHALATE(DEHP)	ND	0.1
BENZYL BUTYL PHTHALATE (BBP)	ND	0.1

REMARK: THE ABOVE LIMIT WAS QUOTED ACCORDING TO US CONSUMER PRODUCT SAFETY

IMPROVEMENT ACT 2008 & AMENDMENT H.R.2715 FOR PROHIBITION ON SALE OF CERTAIN

PRODUCTS CONTAINING SPECIFIED PHTHALATES.

DETECTION LIMIT = 0.01%(W/W)

ND = NOT DETECTED

DATE SAMPLE RECEIVED: OCT.15, 2012

TESTING PERIOD: OCT.15, 2012 TO OCT.19, 2012

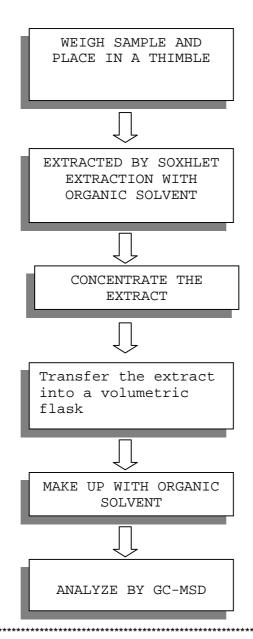


NUMBER: SH AH00345657

**TESTS CONDUCTED** 

MEASUREMENT FLOWCHART:

TEST FOR PHTHALATES CONTENTS (EN14372)



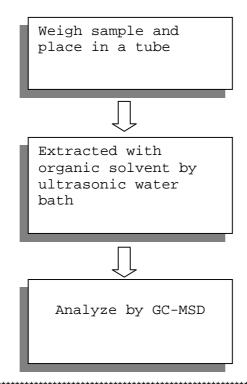


NUMBER: SH AH00345657

**TESTS CONDUCTED** 

MEASUREMENT FLOWCHART:

TEST FOR PHTHALATES CONTENTS (CPSC-CH-C1001-09.3)





**TEST REPORT** NUMBER: SH AH00345657

#### **TESTS CONDUCTED**



**END OF REPORT** 

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Signature yalid For Question Please Contact with SGS www.tw.sgs.com

**Test Report** 

No.: CE/2013/13191 Date: 2013/01/21 Page: 1 of 29

CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF

The following sample(s) was/were submitted and identified by/on behalf of the client as:

Sample Description

: CERAMIC

Style/Item No.

C610

Sample Receiving Date

**Testing Period** 

: 2013/1/14 : 2013/1/14 TO 2013/01/21

Test Result(s)

: Please refer to next page(s).

Conclusion

: Based on the performed tests on submitted samples, the test results of Cadmium, Lead, Mercury, Hexavalent Chromium Cr(VI), PBBs and PBDEs comply with the limits as set by

RoHS Directive 2011/65/EU Annex II; recasting 2002/95/EC.

Chenyu Kung / Signed for and on be SGS TAIWAN LTD. Chemical Laboratory - Taipei



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CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF



#### Test Result(s)

PART NAME No.1

: CREAM CERAMIC

Test Item(s)	Unit	Method	MDL	Result No.1	Limit
Cadmium (Cd)	mg/kg	With reference to IEC 62321: 2008 and performed by ICP-AES.	2	n.d.	100
Lead (Pb)	mg/kg	With reference to IEC 62321: 2008 and performed by ICP-AES.	2	204	1000
Mercury (Hg)	mg/kg	With reference to IEC 62321: 2008 and performed by ICP-AES.	2	n.d.	1000
Hexavalent Chromium Cr(VI)	mg/kg	With reference to IEC 62321: 2008 and performed by UV-VIS.	2	n.d.	1000
BBP (Benzyl butyl phthalate) (CAS No.: 85-68-7)	%	With reference to EN 14372. Analysis was performed by GC/MS.	0.003	n.d.	Ī
DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 117-81-7)	%	With reference to EN 14372. Analysis was performed by GC/MS.	0.003	n.d.	•
DIDP (Di-isodecyl phthalate) (CAS No.: 26761-40-0)	%	With reference to EN 14372. Analysis was performed by GC/MS.	0.01	n.d.	1
DINP (Di-isononyl phthalate) (CAS No.: 28553-12-0)	%	With reference to EN 14372. Analysis was performed by GC/MS.	0.01	n.d.	
DNOP (Di-n-octyl phthalate) (CAS No.: 117-84-0)	%	With reference to EN 14372. Analysis was performed by GC/MS.	0.003	n.d.	17
DBP (Dibutyl phthalate) (CAS No.: 84-74-2)	%	With reference to EN 14372. Analysis was performed by GC/MS.	0.003	n.d.	-
Perfluorooctane sulfonates (PFOS-Acid, Metal Salt, Amide)	mg/kg	With reference to US EPA 3550C: 2007. Analysis was performed by LC/MS.	10	n.d.	-
PFOA (CAS No.: 335-67-1)	mg/kg	With reference to US EPA 3550C: 2007. Analysis was performed by LC/MS.	10	n.d.	
Polychlorinated Biphenyls (PCBs) (CAS No.: 1336-36-3)	mg/kg	With reference to US EPA 3540C method. Analysis was performed by GC/MS.	0.5	n.d.	175

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CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF

Test Item(s)	Unit	Method	MDL	Result No.1	Limit
Polychlorinated Terphenyls (PCTs)	mg/kg	With reference to US EPA 3540C method. Analysis was performed by GC/MS.	0.5	n.d.	
Polychlorinated Naphthalene (PCNs)	mg/kg	With reference to US EPA 3540C method. Analysis was performed by GC/MS.	5	n.d.	91
Alkanes, C10-13, chloro (Short Chain Chlorinated Paraffins) (CAS No.: 85535-84-8)	mg/kg	With reference to US EPA 3540C method. Analysis was performed by GC/MS.	100	n.d.	
PVC	**	Analysis was performed by FTIR and FLAME Test.	-	Negative	1.2
Formaldehyde (CAS No.: 50-00-0)	mg/kg	With reference to ISO 17226-1(2008). Analysis was performed by HPLC/DAD.	3	n.d.	1.3
Monomethyl dibromodiphenyl methane (DBBT)	mg/kg	With reference to US EPA 8270D method. Analysis was performed by GC/MS.	0.5	n.d.	Ĭ
Monomethyl dichlorodiphenyl methane (Ugilec121)	mg/kg	With reference to US EPA 8270D method. Analysis was performed by GC/MS.	0.5	n.d.	*
Monomethyl tetrachlorodiphenyl methane (Ugilec141)	mg/kg	With reference to US EPA 8270D method. Analysis was performed by GC/MS.	0.5	n.d.	
Halogen					100
Halogen-Fluorine (F) (CAS No.: 14762-94-8)	mg/kg		50	n.d.	
Halogen-Chlorine (CI) (CAS No.: 22537-15-1)	mg/kg	With reference to BS EN 14582:2007.	50	n.d.	
Halogen-Bromine (Br) (CAS No.: 10097-32-2)	mg/kg	Analysis was performed by IC.	50	n.d.	-
Halogen-Iodine (I) (CAS No.: 14362-44-8)	mg/kg		50	n.d.	
Organic-tin compounds				The second	
Tributyl Tin (TBT)	mg/kg	With reference to DIN 38407-13.	0.03	n.d.	24.
Triphenyl Tin (TphT)	mg/kg	Analysis was performed by GC/FPD.	0.03	n.d.	



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CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF



Test Item(s)	Unit	Method	MDL	Result	Limit
	3	Motilou	MIDE	No.1	Linine
Asbestos				1	
Actinolite (CAS No.: 77536-66-4)	%		-	Negative	(+)
Amosite (CAS No.: 12172-73-5)	%	With reference to EPA 600/R-93/116	12	Negative	1-1
Anthophyllite (CAS No.: 77536-67- 5)	%	method. Analysis was performed by Stereo Microscope (SM), Dispersion	-	Negative	1.92
Chrysotile (CAS No.: 12001-29-5)	%	Staining Polarized Light Microscope (DS-PLM) and X-ray Diffraction		Negative	1
Crocidolite (CAS No.: 12001-28-4)	%	Spectrometer (XRD).	12	Negative	-
Tremolite (CAS No.: 77536-68-6)	%	Specification (ALLS).		Negative	-
AZO					
1): 4-AMINODIPHENYL (CAS No.: 92-67-1)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	
2): BENZIDINE (CAS No.: 92-87- 5)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	
3): 4-CHLORO-O-TOLUIDINE (CAS No.: 95-69-2)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	-
4): 2-NAPHTHYLAMINE (CAS No.: 91-59-8)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	19
5): O-AMINOAZOTOLUENE (CAS No.: 97-56-3)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	-
6): 2-AMINO-4-NITROTOLUENE (CAS No.: 99-55-8)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	-
7): P-CHLOROANILINE (CAS No.: 106-47-8)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	-
8): 2,4-DIAMINOANISOLE (CAS No.: 615-05-4)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	
9): 4,4'- DIAMINODIPHENYLMETHANE (CAS No.: 101-77-9)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	.8
10): 3,3'-DICHLOROBENZIDINE (CAS No.: 91-94-1)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	•
11): 3,3'-DIMETHOXYBENZIDINE (CAS No.: 119-90-4)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	-
12): 3,3'-DIMETHYLBENZIDINE (CAS No.: 119-93-7)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	- 4

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CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF

Test Item(s)	Unit	Method	MDL	Result	Limit
	Oille	inotiou .		No.1	
13): 3,3'-DIMETHYL-4,4'- DIAMINODIPHENYLMETHANE (CAS No.: 838-88-0)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	
14): P-CRESIDINE (2-METHOXY- 5-METHYLANILINE) (CAS No.: 120-71-8)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	-
15): 4,4'-METHYLENE-BIS- (2- CHLOROANILINE) (CAS No.: 101-14-4)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	4
16): 4,4'-OXYDIANILINE (CAS No.: 101-80-4)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	- 2
17): 4,4'-THIODIANILINE (CAS No.: 139-65-1)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	
18): O-TOLUIDINE (CAS No.: 95- 53-4)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	
19): 2,4-TOLUYLENEDIAMINE (CAS No.: 95-80-7)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	3
20): 2,4,5-TRIMETHYLANILINE (CAS No.: 137-17-7)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	3
21): O-ANISIDINE (CAS No.: 90- 04-0)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	-
22): P-AMINOAZOBENZENE (CAS No.: 60-09-3)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	
23): 2,4-XYLIDINE (CAS No.: 95- 68-1)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	-2
24): 2,6-XYLIDINE (CAS No.: 87- 62-7)	mg/kg	With reference to LFGB 82.02-2. Analysis was performed by GC/MS.	3	n.d.	7
CFC's (Chlorofluorocarbons)					
Group I					
Chlorofluorocarbon-11 (CAS No.: 75-69-4)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
Chlorofluorocarbon-12 (CAS No.: 75-71-8)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	



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CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF



Test Item(s)	Unit	Method	MDL	Result No.1	Limit
Chlorofluorocarbon-113 (CAS No.: 76-13-1)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	4
Chlorofluorocarbon-114 (CAS No.: 76-14-2)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
Chlorofluorocarbon-115 (CAS No.: 76-15-3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
Group III					
Chlorofluorocarbon-13 (CAS No.: 75-72-9)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	7.2
Chlorofluorocarbon-111 (CAS No.: 354-56-3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
Chlorofluorocarbon-112 (CAS No.: 76-12-0)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	-
Chlorofluorocarbon-211 (CAS No.: 422-78-6)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	-
Chlorofluorocarbon-212 (CAS No.: 3182-26-1)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	-
Chlorofluorocarbon-213 (CAS No.: 2354-06-5)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	-
Chlorofluorocarbon-214 (CAS No.: 29255-31-0)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	•
Chlorofluorocarbon-215 (CAS No.: 4259-43-2)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	

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CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF



Test Item(s)	Unit	Method	MDL	Result No.1	Limit
Chlorofluorocarbon-216 (CAS No.: 661-97-2)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	-
Chlorofluorocarbon-217 (CAS No.: 422-86-6)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
HCFCs (Hydrochlorofluorocarbons)					
HCFC-21 (CAS No.: 75-43-4)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	- 1
HCFC-22 (CAS No.: 75-45-6)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	-
HCFC-31 (CAS No.: 593-70-4)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
HCFC-121 (CAS No.: 354-14-3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
HCFC-122 (CAS No.: 354-21-2)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
HCFC-123 (CAS No.: 306-83-2)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	-
HCFC-124 (CAS No.: 2837-89-0)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	-
HCFC-131 (CAS No.: 359-28-4)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	1-
HCFC-132b (CAS No.: 1649-08-7)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	•



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CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF 

Took House	Links	Method	MDL	Result	Limit
Test Item(s)	Unit	Wethod	MIDL	No.1	Limit
HCFC-133a (CAS No.: 75-88-7)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	•
HCFC-141b (CAS No.: 1717-00-6)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	÷.
HCFC-142b (CAS No.: 75-68-3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
HCFC-221 (CAS No.: 422-26-4)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	-
HCFC-222 (CAS No.: 422-49-1)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
HCFC-223 (CAS No.: 422-52-6)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
HCFC-224 (CAS No.: 422-54-8)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
HCFC-225ca (CAS No.: 422-56-0)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	19
HCFC-225cb (CAS No.: 507-55-1)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	2
HCFC-226 (CAS No.: 431-87-8)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
HCFC-231 (CAS No.: 421-94-3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
HCFC-232 (CAS No.: 460-89-9)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	



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CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF

Test Item(s)	Unit	Method	MDL	Result	Limit
	1 440000	1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	MIDE	No.1	Lillie
HCFC-233 (CAS No.: 7125-84-0)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	3
HCFC-234 (CAS No.: 425-94-5)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	-
HCFC-235 (CAS No.: 460-92-4)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	10
HCFC-241 (CAS No.: 666-27-3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	-
HCFC-242 (CAS No.: 460-63-9)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	-3
HCFC-243 (CAS No.: 460-69-5)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	4
HCFC-244	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
HCFC-251 (CAS No.: 421-41-0)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	•
HCFC-252 (CAS No.: 819-00-1)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
HCFC-253 (CAS No.: 460-35-5)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
HCFC-261 (CAS No.: 420-97-3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n,d.	
HCFC-262 (CAS No.: 421-02-03)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	



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CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF



Test Item(s)	Unit	Method	MDL Result No.1	Limit	
	- Cilic	477777		No.1	Limit
HCFC-271 (CAS No.: 430-55-7)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
Halons					
Halon-1211 (CAS No.: 353-59-3)	mg/kg	With reference to US EPA 5021	1	n.d.	. <del>.</del> .
Halon-1301 (CAS No.: 75-63-8)	mg/kg	method. Analysis was performed by	1	n.d.	- 2
Halon-2402 (CAS No.: 124-73-2)	mg/kg	GC/MS.	1	n.d.	
CHCs (Chlorinate hydrocarbon)					
1,1,1,2-Tetrachloroethane (CAS No.: 630-20-6)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
1,1,1-Trichloroethane (CAS No.: 71-55-6)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
1,1,2,2-Tetrachloroethane (CAS No.: 79-34-5)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
1,1,2-Trichloroethane (CAS No.: 79-00-5)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	-
1,1-Dichloroethane (CAS No.: 75- 34-3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	-
1,1-Dichloroethene (CAS No.: 75- 35-4)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	-
1,1-Dichloropropene (CAS No.: 563-58-6)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
1,2,3-Trichloropropane (CAS No.: 96-18-4)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	1.20
1,2-Dichloroethane (CAS No.: 107-06-2)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	7



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CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF

Test Item(s)	Unit	Method	MDL	Result	Limit
				No.1	
1,2-Dichloropropane (CAS No.: 78-87-5)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	- 13
1,3-Dichloropropane (CAS No.: 142-28-9)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
2,2-Dichloropropane (CAS No.: 594-20-7)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	7.17
Carbon tetrachloride (CAS No.: 56-23-5)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	14
Chloroethane (CAS No.: 75-00-3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	-
Chloroform (CAS No.: 67-66-3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
Chloromethane (CAS No.: 74-87- 3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	•
cis-1,2-Dichloroethene (CAS No.: 156-59-2)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
cis-1,3-Dichloropropene (CAS No.: 10061-01-5)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	-
Hexachlorobutadiene (CAS No.: 87-68-3)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	2
Methylene Chloride (CAS No.: 75- 09-2)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
Tetrachloroethene (CAS No.: 127- 18-4)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	



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CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF

Test Item(s)	Unit	Method	MDL	Result No.1	Limit
	Oint	Wethod	MDL		
trans-1,2-Dichloroethene (CAS No.: 156-60-5)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	
trans-1,3-Dichloropropene (CAS No.: 10061-02-6)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	*
Trichloroethylene (CAS No.: 79- 01-6)	mg/kg	With reference to US EPA 5021 method. Analysis was performed by GC/MS.	1	n.d.	•
Sum of PBBs	mg/kg		-	n.d.	1000
Monobromobiphenyl	mg/kg	1	5	n.d.	
Dibromobiphenyl	mg/kg	1	5	n.d.	-
Tribromobiphenyl	mg/kg	1	5	n.d.	
Tetrabromobiphenyl	mg/kg	1	5	n.d.	
Pentabromobiphenyl	mg/kg	1	5	n.d.	
Hexabromobiphenyl	mg/kg		5	n.d.	-
Heptabromobiphenyl	mg/kg		5	n.d.	- 20
Octabromobiphenyl	mg/kg	1	5	n.d.	-
Nonabromobiphenyl	mg/kg		5	n.d.	14
Decabromobiphenyl	mg/kg	With reference to IEC 62321: 2008 and	5	n.d.	1
Sum of PBDEs	mg/kg	performed by GC/MS.	•	n.d.	1000
Monobromodiphenyl ether	mg/kg		5	n.d.	1
Dibromodiphenyl ether	mg/kg		5	n.d.	40
Tribromodiphenyl ether	mg/kg		5	n.d.	-
Tetrabromodiphenyl ether	mg/kg		5	n.d.	1
Pentabromodiphenyl ether	mg/kg		5	n.d.	/
Hexabromodiphenyl ether	mg/kg		5	n.d.	3-
Heptabromodiphenyl ether	mg/kg		5	n.d.	-
Octabromodiphenyl ether	mg/kg	7	5	n.d.	
Nonabromodiphenyl ether	mg/kg		5	n.d.	L ETT.
Decabromodiphenyl ether	mg/kg		5	n.d.	(+1

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CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF



#### Note:

- 1. mg/kg = ppm : 0.1wt% = 1000ppm
- 2. n.d. = Not Detected
- 3. MDL = Method Detection Limit
- 4. " " = Not Regulated
- 5. \*\* = Qualitative analysis (No Unit)
- 6. Negative = Undetectable / Positive = Detectable
- 7. Testing range of asbestos qualitative analysis is from less than 0.1% to 100%. The judgment criterion: asbestos fibers being found is shown as "Positive"; asbestos fibers not being found is shown as "Negative".

#### PFOS Reference Information : POPs - (EU) 757/2010

Outlawing PFOS as substances or preparations in concentrations above 0.001% (10ppm), in semi-finished products or articles or parts at a level above 0.1%(1000ppm), in textiles or other coated materials above 1µg/m².

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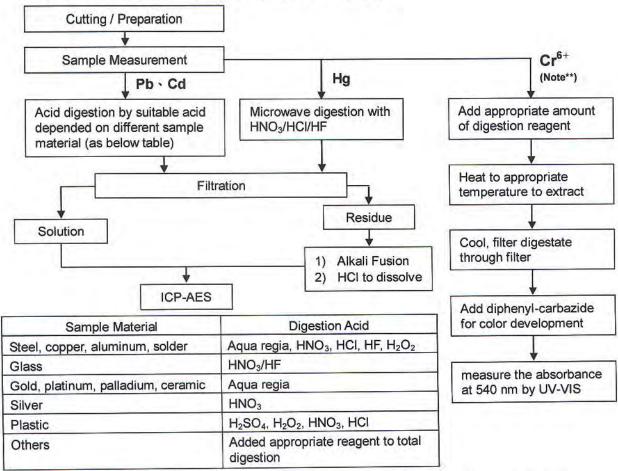


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CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF



- 1) These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr6+ test method excluded)
- 2) Name of the person who made measurement: Climbgreat Yang
- 3) Name of the person in charge of measurement: Troy Chang



Note\*\*: (1) For non-metallic material, add alkaline digestion reagent and heat to 90~95 ℃.

(2) For metallic material, add pure water and heat to boiling.

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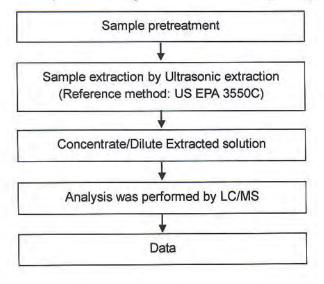
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CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF



### PFOA/PFOS analytical flow chart of Ultrasonic extraction (LC/MS) procedure

- Name of the person who made measurement: Roman Wong
- Name of the person in charge of measurement: Troy Chang



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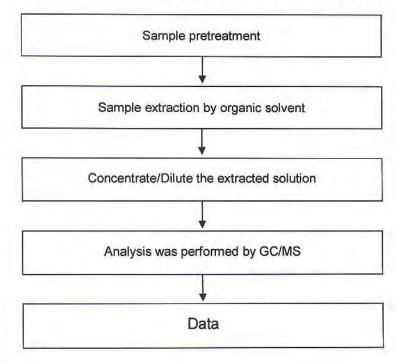
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**CERAMTEC GMBH** GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF



### PCTs analytical flow chart

- Name of the person who made measurement: Barry Tseng
- Name of the person in charge of measurement: Troy Chang



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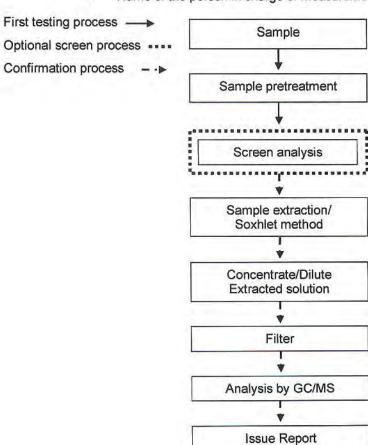
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CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF



### PBB/PBDE analytical FLOW CHART

- Name of the person who made measurement: Roman Wong
- Name of the person in charge of measurement: Troy Chang



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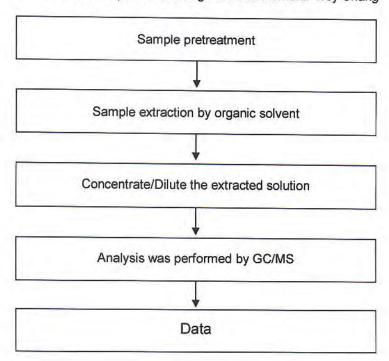
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CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF



### PCBs analytical flow chart

Name of the person who made measurement: Barry Tseng Name of the person in charge of measurement: Troy Chang





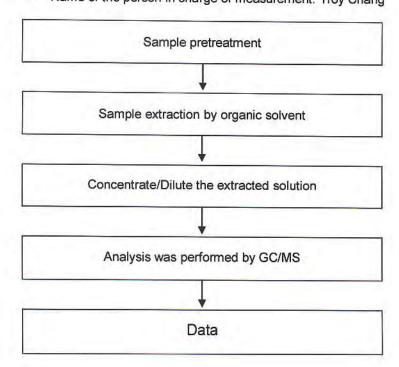
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CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF



### Chlorinated Paraffins analytical flow chart

Name of the person who made measurement: Barry Tseng Name of the person in charge of measurement: Troy Chang



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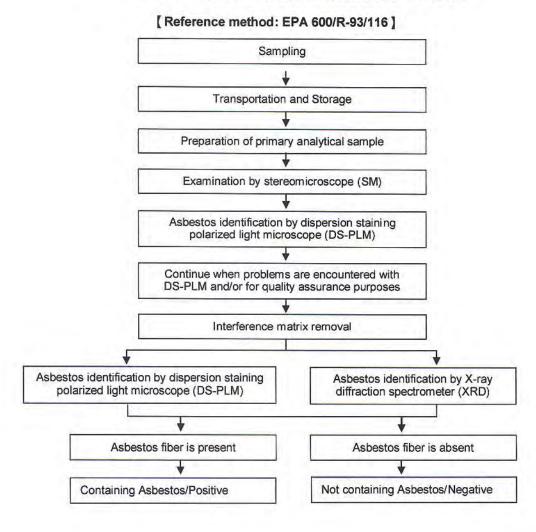
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CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF



### Analysis flow chart for determination of Asbestos

- Name of the person who made measurement: Victor Kao
- Name of the person in charge of measurement: Wendy Wei



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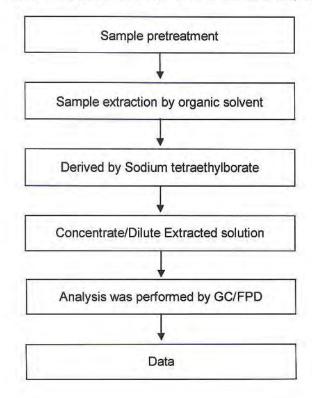
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CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF



### Analytical flow chart of Organic-Tin content

- Name of the person who made measurement: Ginny Chen
- Name of the person in charge of measurement: Troy Chang





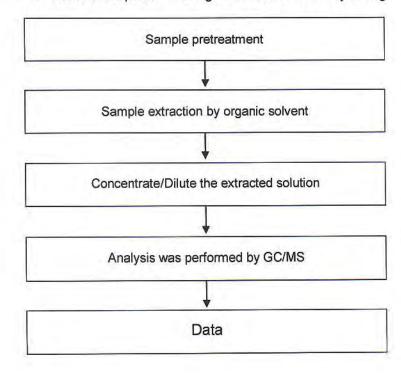
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CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF



#### PCNs analytical flow chart

- Name of the person who made measurement: Barry Tseng
- Name of the person in charge of measurement: Troy Chang



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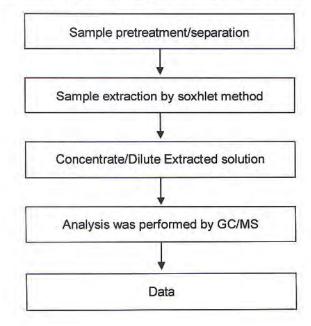
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**CERAMTEC GMBH** GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF



### Analytical flow chart of phthalate content

- Name of the person who made measurement: Roman Wong
- Name of the person in charge of measurement: Troy Chang





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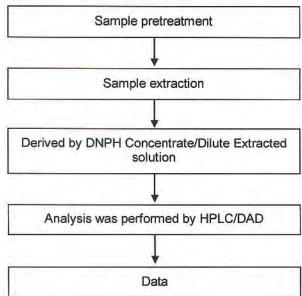
CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF



#### Formaldehyde analytical flow chart

- Name of the person who made measurement: Scott Ku
- Name of the person in charge of measurement: Troy Chang

[ Test Method : US EPA 8315A . ISO 17226-1 ]



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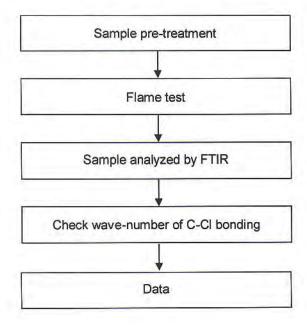
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#### Analysis flow chart for determination of PVC in material

- Name of the person who made measurement: Ginny Chen
- Name of the person in charge of measurement: Troy Chang



Member of the SGS Group



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### **DBBT** analytical flow chart

- Name of the person who made measurement: Roman Wong Name of the person in charge of measurement: Troy Chang
  - Sample pretreatment/separation Sample extraction by soxhlet method Concentrate/Dilute Extracted solution Analysis was performed by GC/MS Data



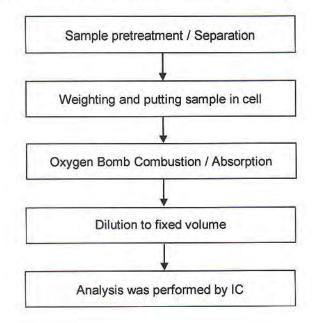
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### Analytical flow chart of halogen content

- 1) Name of the person who made measurement: Rita Chen
- 2) Name of the person in charge of measurement: Troy Chang





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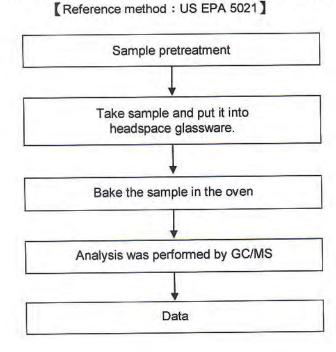
CERAMTEC GMBH GESCHAFTSBEREICH MULTIFUNKTIONSKERAMIK, LUITPOLDSTRABE 15, 91207 LAUF



### Analytical flow chart of volatile organic compounds (VOCs)

Name of the person who made measurement: Chun Wu

Name of the person in charge of measurement: Shinjyh Chen



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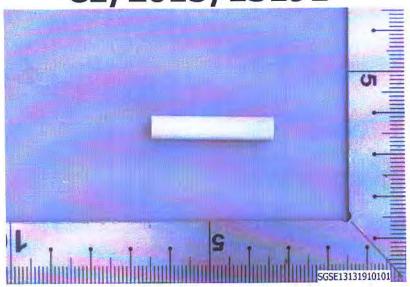
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\* The tested sample / part is marked by an arrow if it's shown on the photo. \*

CE/2013/13191



\*\* End of Report \*\*

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